THE PPT STORY

On 29 January 2020, I established a chapter of Precious Plastic (PP) at Taringa. PP itself is not an organisation with headquarters as such, rather, it is a loosely affiliated group of likeminded individuals who are keen to investigate ways to reuse and recycle plastic waste. Most PP chapters have more than one member, but (as in my case) a chapter can start with only one person. There is no "registration" process to start a PP chapter, one merely decides to align oneself with the movement and adopt the insignia etc, which is all open source and free to use. PP is a grassroots movement, and although we are all under the same branding, most operations are independent of each other and do not collaborate.

I branded my operation "Precious Plastic (Taringa)", despite caution from PP about using locality names. There is a Facebook group named "Precious Plastic Brisbane", which was formed around 2018 and has very little activity. The overwhelming majority of PP activity in Australia is definitely in Melbourne.

I started out collecting bottle caps and certain coloured bottles. At the time, I was taking my 10c recyclable containers to a depot in Rocklea and they started giving me thousands of bottle caps each week which came through there. The stream also included items such as plastic straws, and metal bottle caps and glass cullet. These last two items were initially discarded until I realised there was a value in collecting them so after a few months, I began sorting metal and glass too. The amounts of metal and glass were very small, but over time these built up, as did the plastic. My garage filled up and then I began storing in the front yard. That's when the trouble began.

Even before I was storing plastic in the front yard, I was using that area to process the material from Rocklea, which usually took a couple of days and involved sorting it, soaking in water to clean and then drying.

The Department of Housing immediately took a dim view of my operation and has been vigourously persecuting it from the beginning. Over the last two years there have been dozens of inspections of my front yard by a myriad of people all claiming to be Department staff. Many of these visits occur when I am not home and often they are so-called "drive-by" inspections. I have lost count of the number of breach notices issued to me. I have been issued with three Notices to Leave. The first one resulted in three QCAT hearings last year; eventually the Department dropped the case. The second Notice led to a hearing in QCAT on 26 April and a Warrant of Possession issued. I have applied for a Stay on the execution of this Warrant pending an appeal of the Decision.

The Department has alleged that they have received complaints from various sources, but I have never received any complaints directly, and no evidence has ever been provided by the Department to substantiate these complaints. It's all on their say-so. At least one of these so-called "complainants" could be a frequent visitor of my next-door neighbour in Unit 4. The sole authorised tenant of that unit has told me on numerous occasions he has no problem with my operation provided it is kept within my own front yard and does not spill into his. He’s also provided me with a signed written statement to this effect. His visitor however is militantly opposed to the operation and has been seen photographing and filming on their phone. I firmly believe that this person is responsible for most of the "complaints" received by the Department, and I consider it highly inappropriate for them to be taking action based on the opinions of a person who does not even live in this suburb.

In contrast to the attitude of the Department, the Brisbane City Council has been monitoring my operation and occasionally there is a need to bring me back into line, which involves an officer coming to speak with me. At all times, these engagements have been civil, courteous and easily resolved, due to the conciliatory approach by the officer, who is also supportive of my operation.

My plastic recycling initiative enjoys in-principle support from many close residents, local politicians and other industry figures. Mild interest has also been shown by the ABC and I intend to foster this relationship in due course.

The journey I have taken started in June 2020 when I started looking for a place to get the parts for the PP shredder (version 2.1) cut. This task alone took a month, eventually the parts were laser cut by Samin Metal at Meadowbrook at a cost of about $550. This was only the start. Once I had the parts, I then had to work out how to assemble them, and how to drive it. A friend eventually agreed to help me put it together, and over about a month in August/September we nutted it out, discovering that many more parts were needed to make it work, and then I had to find a suitable motor and construct a drive train.

We managed to get the shredder working on 2 October 2020. It devoured the bottom of a milk bottle – just. It jammed on the second attempt when the plastic folder over on itself while feeding into the shredder. Unjamming was a nightmare, requiring disassembly of the drive train. It became obvious to me that this shredder would probably be ok for small items like bottle caps, but it would not handle anything bigger.

By this time, the plastic was becoming a problem in my front yard and the Government was not happy about it, despite my attempts to keep it neat and hidden from public view. I began looking for storage options. After looking at a few options which turned out to be unsuitable ,I found some space under a private house which I leased for $50 per month. I put about a dozen bulk bags from my garage and a few bins of bottle tops from the front yard there. A lot of material from the front yard was then moved into the garage. This only lasted a few months before the owner told me they had decided to sell their house and I needed to move again. I moved the bags and bins into a shipping container at Oxley which I had started leasing at about the same time as the under-house area. The container cost $281/month. I immediately put my stockpile of bottle caps in there, and the shredder. There was an opportunity to use the shredder in the container, and I did have a few sessions with it, but the more I used it, the more I was convinced of its limitations.

The Federal Government was making lots of noise about plastic recycling around this time which has continued to be a major focus in the two years since. The announcement of the Recycling Modernisation Fund (RMF) got me very excited, and I anticipated some government assistance might come my way in the next year or so. With that in mind, in December 2020, I signed a 12-month lease on an 84m² commercial shed at Willawong, 20km from my home. The lease was $1,760/month - about 90% of my pension. Before signing this lease, I calculated that I had enough financial reserves to service the lease until about August 2021, beyond which it would be very tight but still manageable. In the intervening period, I hoped I would be able to secure some kind of Government funding to support my operation. I decided that if the plastic operation was not feasible by the end of the 12-month lease, I would stop.

One of the major reasons I went for the commercial shed and not just a storage space was the availability of 3-phase power, which I wanted to operate machinery. I had already begun to investigate machines to process the plastic, and I had built a small shredder in October 2020. Unfortunately, testing this shredder proved it was not powerful enough to handle most of my material, so I was looking for something else. My investigations had led me to the world of 3-phase powered machinery.

I moved nearly everything into the Willawong shed, but I continued to process material in the front yard at Taringa because it was more convenient. This meant that small quantities were stored in the front yard, but the turnover of these items rapidly increased as I moved them to Willawong frequently.

Despite the mountains of money I was spending to minimise the impact of the operation at Taringa, the Department continued their harassment and bullying tactics. They continued to inspect my front yard and, seeing it was not empty, they deemed it "unacceptable" and "full of rubbish".

Numerous written communications from the Department have described the material stored in my front yard as "rubbish", or "refuse" which has apparently been "dumped" there. Such language is deeply offensive to me and is blatantly untrue. These items are not rubbish, nor have they been merely dumped. Rather, they are valuable assets of my company, carefully sorted and stored in a temporary holding area pending their transfer to more suitable storage.

The big hurdle in the operation is getting a suitable machine to reduce the volume of the plastic. I began researching options for such a machine as early as May 2020, just a few months after I started collecting. I was aware that the volume of plastic would quickly require a lot of space and I needed to shred it up to make it more compact. To address this issue, I started building a shredder in June 2020 based on plans from the PP website. This process cost nearly $2,000 and took quite a few months. As I referred to earlier, this small shredder was not able to shred much more than a milk bottle, and even that took a lot of effort. Objects such as chairs and wheelie bins and other thicker plastics would have no chance of getting through this shredder. I had to look for something bigger.

By this stage, nearly all my money was going to the lease on the Willawong shed, so I found myself stuck in a corner. With no finances to purchase a machine, and a constantly increasing stockpile of plastic, I was desperate for some Government help. And the Federal Government was splashing a lot of serious money around recycling initiatives at the time. Surely I could get a few small crumbs for my humble operation? Well, as of May 2022, I'm still waiting for my first dollar of Government assistance.

In March 2021, I was invited by a friend to send 10kg of PET and 10kg of HDPE to Melbourne for a research project. He had arranged to get the plastic processed through a granulator. I went along to watch. We loaded up my friend's van full of plastic bottles and containers. When we left, each type of shredded plastic fit inside half a wheelie bin. The reduction in volume was spectacular. I knew this was the kind of machine I needed to get. Immediately I began searching for a granulator. They were not cheap, the lower end ones were over $6,000 second hand and $10,000 new.

I found a small granulator online in Sydney for about $3,000 which seemed like it would suit me fine. I was eager to go to Sydney and check it out, but of course there were restrictions due to COVID so I could not. I asked a friend if he would loan me the money for a machine about this price, offering to pay out the loan when I got the bond back from Willawong at the end of the year. He agreed to that deal, so I made moves to get the granulator from Sydney. Detailed discussion with the vendor revealed that this granulator had a very small inlet and was only designed to handle small, thin objects about half the size of an A4 page. It became apparent then that this machine would not process most of my plastic. I had to find something else.

Just then, one of the many PP chapters in Melbourne offered a granulator for sale. They wanted $4,500 for it which was over my budget, but I managed to negotiate them down to $4,000, including freight. My friend agreed to finance this, so the purchase was made in early June 2021.

Yet another lockdown in Melbourne prevented the granulator from leaving Melbourne for two weeks after the sale. I finally took delivery on 23 June 2021. Another setback immediately revealed itself when I discovered that the 3-phase plug on the machine had 5 pins, but the sockets in the shed had only 4. A week of investigating this led to an electrician coming out to the shed and installing a 5-pin socket, which I had to pay $600 for.

Finally able to plug the machine in and start it up, I put a piece of purple polypropylene from a broken storage container in as the first batch. It took a long time to shred, about 15 minutes if I remember. I was rather disillusioned by this; if the processing is this slow, it will take a long time to get through a whole shed of plastic. I asked around for advice and someone suggested checking the blade position and maybe getting them sharpened. I went through this process, adjusting the blades as best I could with a small improvement in output. I enquired about sharpening, and as it was only $70 for all four blades, I decided to have that done.

When I picked up the blades after having them sharpened, I was told that they were very close to the end of their useful life and I will not be able to sharpen them again; I will need to buy new blades. As a result of this, the blade position on the rotor was at its maximum, which affected my ability to get an optimal gap. Despite these disabilities, I was able to successfully begin granulating some of the larger plastic items. I processed some small blue swimming pools, a number of chairs and washing baskets and quite a few wheelie bin lids. I noticed that each batch was contaminated by the previous batches, so I made sure to thoroughly clean the machine between each batch. The 4mm screen was proving to be a bottleneck in the processing, increasing the time required for material to pass through the machine. I enquired about getting a screen made with bigger holes.

I did not use the granulator much while it was at Willawong, due to the time required to process material and the tedious cleanup process between batches. Using the machine was quite messy too. There were a lot of spills and the granulated plastic developed a static charge which made it difficult to transfer it from the machine output hopper to a bag for storage.

By October, I had to change my focus from processing plastic to moving it all out in preparation for the end of the lease. Another complicating factor in all of this was that the insurance company for the commercial unit complex had decided that plastic recycling was an unacceptable fire risk and they refused to renew the insurance policy until I had moved out. This caused significant acrimony between the body corporate and the owner of my unit. The body corporate threatened the owner with court action and tried to terminate the lease, but both the owner and I ignored their threats and carried on. The owner knew I was not looking to renew the lease and made up his mind to sell the unit after the ruckus caused by body corporate. He was therefore not in a hurry to have me out exactly on the last day of the lease, and especially with Christmas/New Year, he was busy and then on holiday, so we agreed that as long as I was out by the end of the year, we would do the final inspection early January and he would return the bond. By the way, my landlord was very kind and allowed me to use some of the bond in lieu of the final month's rent, which helped my cash flow enormously.

Where was I going to move an entire 84m² shed full of plastic? I had to find a solution very quickly. I found a garage around the corner from me for $200 per month. A few weeks later, another one came up at Toowong for the same price, so I snapped that up too. These garages are used for storing washed plastic bags and bottle caps respectively. They are both very full. The rest of the stuff from Willawong was taken to a storage shed at Sumner. This shed filled up too, so I rented a second one there. Some bags at Willawong needed processing, so I brought them to my front yard for that. My intention was to get these bags processed and stored, then I could focus on getting the machine working properly, with new blades etc.

When I received the refund for the bond, I made two purchases connected to the granulator. The first of these was a mesh screen with 12mm holes, which would make processing more than three times faster than the original 4mm screen. At $605, this wasn't cheap, but I realised it was an essential accessory to have. The other capital purchase was a variable frequency drive (VFD), a device which converts standard single-phase electricity to three-phase. Using a VFD, I should, in theory, be able to run the granulator with a single-phase supply. Unfortunately, my plans to use a standard 10A supply have been proven to be unrealistic. It has been confirmed by two independent sources that I will need a 20A supply to operate this machine.

The granulator itself was moved to the Rocklea recycling depot. The operator of the depot had a small shed on his premises which he was going to let me use for operating the machine, but before allowing this to happen, he wanted to run the idea past his landlord. While these negotiations were taking place, the flooding of late February 2022 affected the Rocklea area very severely. The recycling depot was inundated with 1.5m of water, including my granulator. The Queensland Government *might* be able to provide some financial assistance for the flood damage, but even this is not guaranteed, and there are many hoops to jump through in the application process.

The rainy start to 2022 also affected my plans to process the material in the front yard, kicking up mud and generally making things very messy. No sooner had I cleaned up the effects of one rain event, another would come and make it all muddy again. Progress was painfully slow. Crates and boxes could not be moved into storage with mud on them, especially the new facility at Chapel Hill with its carpet floor. It was also a major challenge to prevent cardboard boxes from getting damaged by rain. A further complication was my positive test for COVID in late January, which prevented me from working for 7 days. Fortunately, with the break in the weather during March and April I was able to make much more progress. I successfully achieved my goal of having the front yard back to the state the Department last considered "acceptable" by the end of the Easter period. True to form, however, the Department again changed its view and considered the front yard not good enough.

Unfortunately, the Department of Housing has made no allowances whatsoever for all the setbacks I was experiencing and just rolled through their statutory process: two Notices to Remedy Breach, followed by a Notice to Leave, followed by a QCAT application for Warrant of Possession, which was duly granted.

My current plans for moving forward with this operation include the design and build of a suite of small machines to process the material I have stockpiled. The machines include the following:

- **Agglomerator**, for processing plastic films such as bags into denser granules or pellets.
- **Bottle cap sorting machine**, for sorting homogenous caps together by size, type and colour.
- **Strap cutter**, for processing plastic strapping into small uniform pieces.
- **Glass pulveriser**, for making glass sand/gravel.

I have written detailed descriptions of these machines in a separate document. The output of all these machines is small pieces of material in the form of granules or fragments or pellets. Ideally, the size should be as small as possible. I want to have these machines built ASAP, but I need practical help to make this happen.

I have finally begun to make a concerted effort to get the granulator working again, as it is the most important piece of equipment in the processing chain. Although various levels of government have offered financial compensation for the flood damage, the process to apply for this is tedious and cumbersome, and funds are likely to be quite a few months away. I realise I will have to fund the repair of this machine myself upfront and hopefully wait on the government yet again.

The perennial question then comes up – what to do with the processed material? There are essentially only two options here: use it myself with other machines to make new products, or sell it to someone else who will either make something out of it or use it in another application. I have not explored either avenue in detail. Making new plastic objects usually requires a process of extrusion or moulding and, although PP has open source plans for machines to do these, I'm not particularly interested in this aspect. There are applications for plastic granulate and glass sand/gravel in civil engineering projects such as road base and as a filler in concrete. Plastic has the advantage of being lightweight, highly flexible and strong. These properties make plastic a good additive for road base, although different resins are being tested to determine which is best. Early results suggest PET is the leading candidate, which is exciting news because PET is the most common type of plastic waste, yet it is the most difficult to recycle due to its high melting point and tensile strength. HDPE, the second most common plastic type is much easier for hobbyists to work with.

A report from Melbourne released in 2021, which dealt with the use of plastic waste in road base suggested a market price of $1,000/t for scrap plastic. A price this low makes plastic recycling highly uneconomical. One tonne of plastic takes a lot of volume and a lot of processing. It costs more than $1 to produce 1kg of plastic granules. Some PP vendors are asking $25/kg for plastic shreds, which I think is way over the top. A reasonable equilibrium would be about $8-10/kg.

Some financials:
For the period 2020-01-01 to 2022-04-14

	6-month period ending					
	2020-06-30	**2020-12-31**	**2021-06-30**	**2021-12-31**	**2022-06-30**	**TOTAL**
DSP received	14,058.81	14,305.01	14,163.49	14,661.41	7,991.89	**65,180.61**
Company income			662.12	5,237.33	3,291.87	**9,191.32**
Balance of outstanding loans (excluding interest)			4,500.00	6,500.00	3,436.00	
Cash transfers from DSP to company account			4,437.78	9,082.06	3,908.78	**17,428.62**
Machinery	506.12	777.69	4,000.00	77.00	1,074.86	**6,408.67**
Storage costs		795.00	1,686.00	2,947.90	4,751.00	**10,179.90**
Commercial lease		8,800.00	10,560.00	7,040.00	-5,280.00	**21,120.00**
Public housing rent	2,687.10	2,687.10	2,687.10	2,687.10	1,550.25	**12,298.65**

DSP received includes advances and any one-off payments or bonuses.
Storage costs do not include the Willawong lease (listed separately)
All amounts include any applicable GST.
Also note that before the company had an official bank account, transactions for company expenses were paid from my personal accounts. Some transactions are still funded this way, especially consumables, etc. Most of these transactions are not included in the above figures.

It all boils down to this: I need to get the granulator working and build the suite of small machines so I can begin to process the stockpile of plastic I am currently paying $1,400/month to store. When all the machines are running, it should only take a few months to process it all and then the storage costs decrease dramatically. The dilemma of this is that I need funding for these capital expenses. I cannot get any kind of loan because I am on welfare. Government grants have so far been unavailable. Storage costs are strangling my ability to fund this myself, and I have not found anyone willing to help with the practical side as I do not have the knowledge or skills to make these machines. I also need to find someone willing to pay a reasonable market price for the finished product.