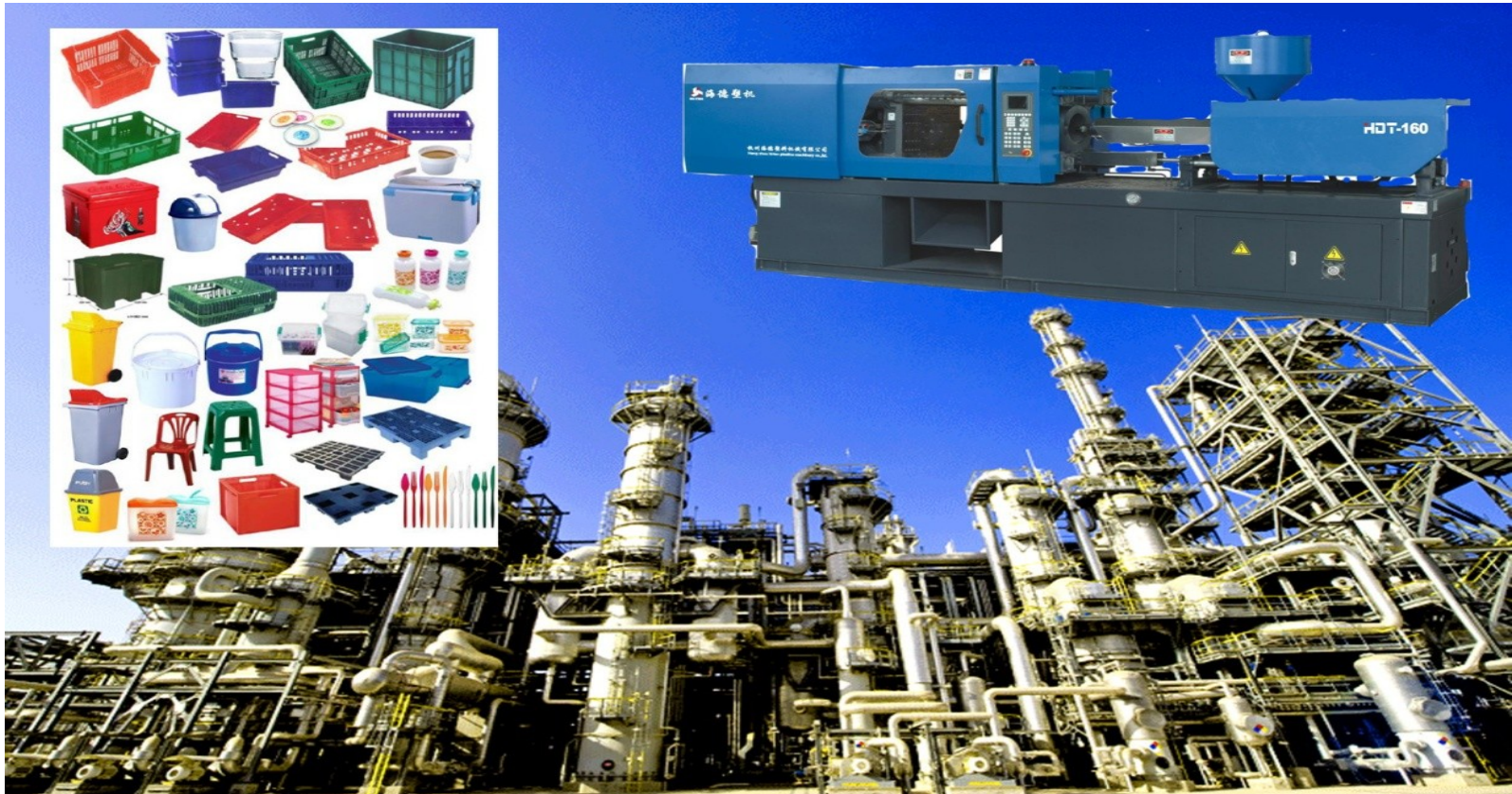


Are Plastic (Bags) to be Blamed?

Tan Choo Eng, MNS Penang



Plastic or Synthetic Polymers have a relatively short hundred years history. Yet it must be considered one of the most important industrial raw materials for mankind. In the league of steel, concrete, wood and the like. Although the term plastic is more of a lay man term, in scientific circle it is called “polymers” or even “high polymers”. And in trade or commerce the term “resin” may be used.



Some examples of natural polymer, includes, cellulose, natural rubber, silk, spider-web, cotton and wool.



Like it or not, plastic is essential to our society. And within the past few years Plastic bag and Plastic packaging material, in particular, styro-form and plastic mineral water containers have been blamed for all sorts of environmental problems.

Table 1 TYPES OF PLASTIC AND THEIR USES

PLASTIC	TYPICAL USES	PROCESSING METHODS
LOW DENSITY POLY-ETHYLENE (LDPE)	Carrier Bag, Plastic Bag, Super-market Bag, as a laminate with paper	Blow Moulding
HIGH DENSITY POLY-ETHYLENE (HDPE)	Folding chairs, table top, water pipe, shampoo bottle, plastic caps	Injection Moulding, Blow Moulding
POLY-PROPYLENE (PP)	Rigid and chemical resistance pipe and tubing. Non-woven	Extrusion, Blow-Moulding
POLY-VINYL CHLORIDE (PVC) VINYL. Rigid and Flexible	Rigid- tubes, pipe fittings, bath-room doors. Flexible – Soft toys, gloves.	Rigid-extrusion, injection moulding. Flexible, dipping rotational moulding
POLY-ETHYLENE TEREPHTHALATE (PET)	Carbonated bottles, synthetic or polyester fibre	“Pre-formed” Blow Moulding, Hot melt spinning
POLYSTYRENE	Food boxes, CD Case, Insulation foam, “plastic cutlery”	Thermoforming, Injection moulding
POLYCARBONATE	Safety Glasses, “Big water bottle” Baby feeding bottles, Jugs for Blenders	Extrusion, Injection moulding, thermoforming, machining
POLYMETHYL-METHACRYLATE (PMMA) PERSPEX	As a substitute for glass, used in advertising signage,	Injection moulding, Casting
POLYAMIDES - NYLON	As bristle and in brushes, as a fabric for stocking, clothing, etc. Engineering Plastic	Melt-spinning, Extrusion, Casting, Injection Moulding



Penang to ban plastic bags from January

By Christina Chin, The Star, November 3, 2010

GEORGE TOWN: Come Jan 1 (2011), plastic bags will be practically banned state-wide. The move – an extension of the current “No Plastic Bag Day” in shopping centres and hypermarkets on Mondays, Tuesdays and Wednesdays – means that no plastic bags can be used every day by almost all business sectors.

No Plastic Bag day? Customers say ‘I would rather pay’

By QISHIN TARIQ and WINNIE YEOH , The Star

Sunday September 25, 2011

PETALING JAYA: Consumers in the Klang Valley are still using plastic bags when they shop despite the “No Plastic Bag” campaign introduced early this year.

Trader Mohd Noor Mohd Salleh, 32, said the policy was not that effective.

“At 20 sen a plastic bag, people can afford to pay for a few if they don't bring their own bags,” he added.

COUNTERTHINK



FACT: SAN FRANCISCO BANNED PLASTIC BAGS, BUT NOT THE TOXIC FOOD PRODUCTS CARRIED IN THEM. WWW.HONESTFOODGUIDE.ORG

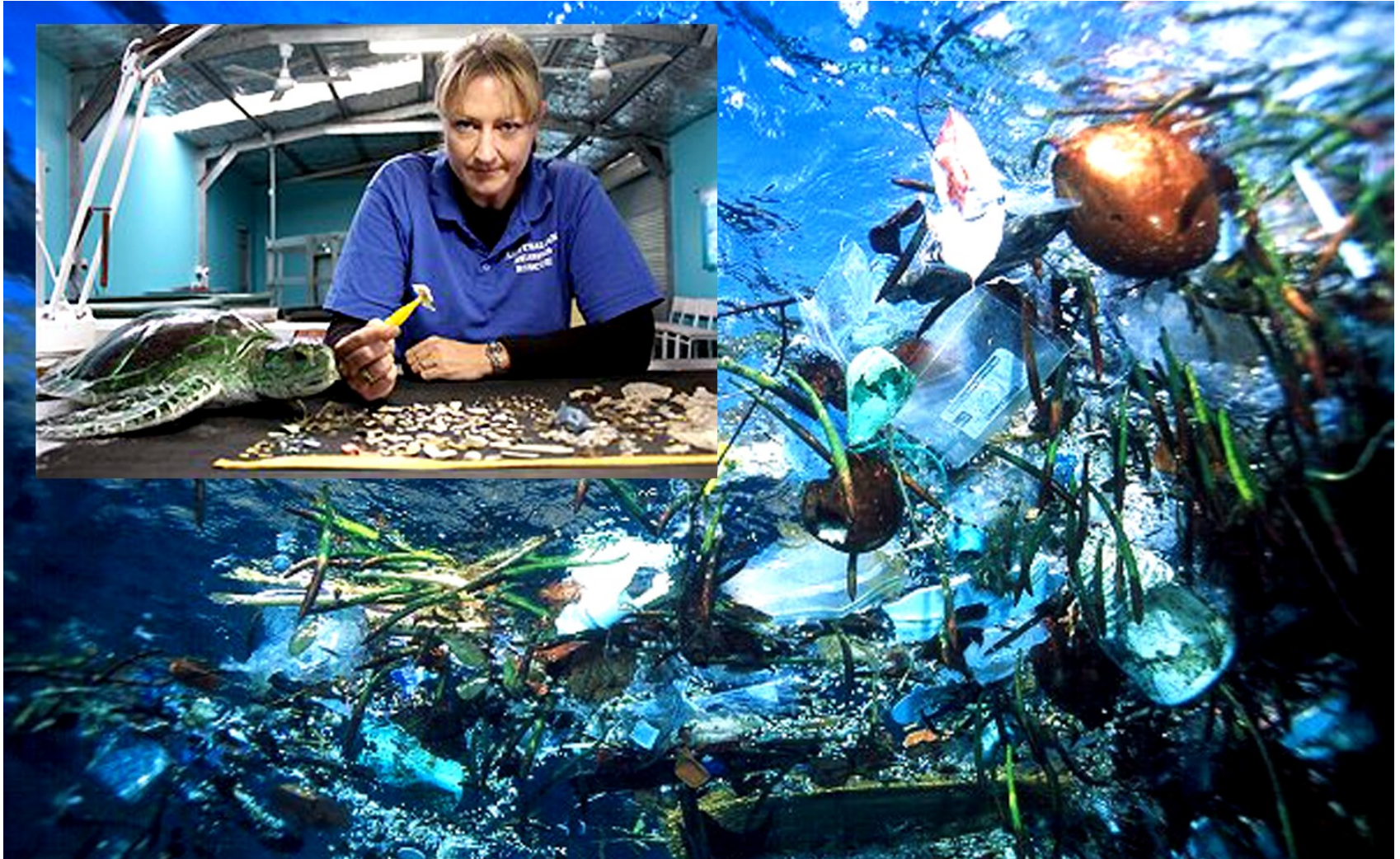


PLASTICS KILLING TRENGGANU'S TURTLES

Pieces of plastic floating in the ocean often mistaken for food or jellyfish by turtles may be one of the reasons for their deaths. World Wildlife Fund (WWF)-Malaysia Terengganu Turtle and Terrapin Conservation Programme chief Rahayu Zulkifli said shards of plastic were found in the stomach of dead turtles in the state. Thus, she urged the people, especially fishermen, to cooperate by not throwing plastics into the sea as they could kill turtles.



**Ocean with floating plastic and other waste,
insert – Sea turtle found dead with plastic
debris inside stomach.**



Whale washed up dead found to have eaten pieces of rope, plastic and a golf ball

By [Christine Show](#), Daily Mail, UK PUBLISHED: 13:34 GMT, 25 April 2012



A whale that washed up to shore dead had swallowed pieces of rope, plastic, a golf ball and other debris.

Scientists are trying to determine what killed the gray whale, which was found on Sunday on Puget Sound in Washington state.

An examination of the animal's stomach showed that the whale had also eaten shrimp, flat spongy material, woody debris and algae.

Officials with the National Oceanic and Atmospheric Administration - Fisheries have ruled out the debris as the cause of death.

Despite testing, researchers may not be able to figure out what caused the whale's death

Certain Myths and Misconceptions of Plastic

“Like Diamonds , Plastics are Forever”



- 1) **“It takes years to degrade”, often quoted up to 100 or 500 years or even “thousands of years” So how long does it takes to degrade - it all depends, and for the case of the Plastic Bag, on the type of polymer use, the thickness, the colour. And also were there any additives like anti-oxidant or anti-ozonant added. And just as important how it was disposed off.**

Most landfill are “sanitary” landfills, most things (except for food and vegetable and animal matter) will takes years to degrade.

As a polymer chemist I would like to synthesize polymer that can last for say 500 years.

2) How long it takes to degrade also depends on the type of polymer, and more importantly whether it is a thermoset or thermoplastic. Thermoset in general cannot be recycled except to grind it up as a “filler” material. Most “rubber” including vehicle tyres are considered as thermoset.



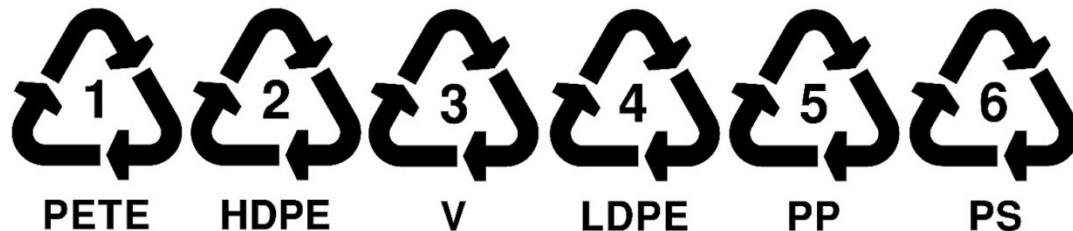
- 3) It does photo degrade, how rapidly depending on conditions, it does breaks down into “oligomer” etc, etc, and may enter the food chain.**
- 4) Plastic is easily recyclable, again it depends on the type of plastic, most thermoset are not recycled. Most used plastic bags are not recycled as they are usually contaminated with food matter. Recycling plastic usually uses less energy as the melting point is much lower compared to aluminum or steel or glass.**

Some Facts about Plastic and Plastic Waste

- 1) Plastic makes up of 10-20% of landfill by volume and probably less than 10% by weight.



- 2) Because of Plastic relatively low density (light weight) its use in transport vehicles has resulted in a considerable weight savings thereby increasing fuel efficiency for all types of transport.
- 3) Most plastic are produced from oil or natural gas. Both are running out and with limited supply. Examples of plastic made from natural gas are the poylethlene and polypropylene plastic, and a component of synthetic rubber is also usually natural gas.
- 4) It usually uses less energy to make a plastic product say a plastic bottle versus a glass bottle. But if you were to include the energy to make the plastic resin – the energy used would not be much less.
- 5) Plastic products with the “chasing arrow” symbol does not means that ALL can be recycled, it is more to identify the polymer type although it does assist greatly if that product is send for recycling.



RECYCLING OF PLASTIC

THE HARD FACTS

- 1) Plastic is one of the easiest and cheapest materials to be recycled. It is easy to recycle because of its relatively low melting point, and being fairly inert it does not degrade easily during recycling. But not all plastics fall into the easily recycled type.**
- 2) Other Plastic can be difficult to be recycled because, of the type of plastic, example it is a thermoset. Styroform are also difficult to recycle because of its bulk – it is expensive to transport and it is usually contaminated with food residue.**
- 3) The recycling ratio for plastic that are easier to recycle (example PET Bottles, followed by Shampoo, washing liquid bottle (PE)) is about 20%. Overall if we do not include tyres and thermoset it could be less than 5%. Vinyl Products (PVC) both rigid and soft are difficult to recycle.**
- 4) Recycling can be either mechanically shredding the plastic waste, washing and just drying for use again as a cheaper component (especially when virgin resin are expensive) or for a cheaper – low end product. It is usually a labour intensive process.**
- 5) Chemical recycling, which is usually more hi-tech and can be capital intensive, this involves a process known as de-polymerization where the original or some of the original component is obtained again. You need a constant supply of plastic waste.**

- 6) Recovery of fuel or energy by incineration of waste plastic, but expensive chemical scrubbing of toxic and carcinogenic flue gas is usually required. This is best for difficult to recycle plastics and for areas or countries where land is scarce for landfills.
- 7) Recycling can be a messy, dirty and dangerous business, which may even produce more waste. Is it fair for a developed country to export its waste to be recycled?



8) For Plastic recycling to be successful a two-prong approach is required:- Education and Legislation. The consumer must be thought about the type of plastic he or she uses, and what can or cannot be easily recycled. There shall be legislation for the consumer to spate plastic waste that are recycled from other waste.



9) Incentives – including monetary have be considered to encourage plastic recycling.

CAN WE LIVE WITHOUT A PLASTIC BAG?

Probably Yes

DO WE NEED PLASTIC?

YES!



Blood Bags are still make from Plasticized PVC (Vinyl) Material

- **PVC is one of the most environmentally unfriendly plastic, during manufacture during use and during recycling.**
- **Its hazard when used as a “soft” vinyl as in Blood Bags is from the phthalates that are used to soften the normal hard PVC.**
- **At present there are few economical and reliable substitute for PVC blood bags although “safer” phthalates are being used.**
- **As students I suggest that you must make an informed opinion, go find out more about plastic, about the recycling industry and the recycling process.**
- **Malaysian Nature Society is a scientific organization, we fight for Nature and the Environment, for Sustainable Development, based on facts and figures.**

