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Conservation of fresh water supplies – or, rather, lack of it – is yet another serious environmental issue receiving scant attention from the government. In this issue, we look at some sobering aspects of Hong Kong’s water supplies and consumption.

The Editors

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FRESH WATER: A CRITICAL AND SCARCE RESOURCE

Water is scarce

On 12 February 2016, under the heading Two-Thirds of the World Faces Severe Water Shortages, the New York Times reported:

“About four billion people, or two-thirds of the world’s population, face severe water shortages during at least one month every year, far more than was previously thought, according to Arjen Y. Hoekstra, a professor of water management at the University of Twente in the Netherlands.

In a paper published Friday in the journal Science Advances, Dr. Hoekstra and his colleague Mesfin M. Mekonnen designed a computer model to create what they say is a more accurate picture of water scarcity around the world. Severe water scarcity can lead to crop failure and low crop yields, which could cause food price increases as well as famine and widespread starvation.

An area experiences severe water scarcity when its farms, industries and households consume double the amount of water available in that area.

“That means that groundwater levels are falling, lakes are drying up, less water is flowing in rivers, and water supplies for industry and farmers are threatened,” Dr. Hoekstra said.

Half of the four billion people who experience conditions of severe water scarcity at least one month of the year live in either China or India, Dr. Hoekstra said. Of the remaining two billion, the majority live mostly in Bangladesh, Pakistan, Nigeria, Mexico and the western and southern parts of the United States, such as California, Texas and Florida.”

In the 2015 edition of the World Economic Forum it was reported that lack of fresh water is the most serious global environment risk we face. One third of the world’s population suffers severe water shortages for at least one month each year; more than 500 million face severe water scarcity the entire year; and 50% of the world’s biggest cities have regular fresh water crises.

Whilst the global total volume of potable water – both surface and aquifer sources – is 14,000 km³ and only 5,000 km³ is presently accessed for human activity, the uneven geographical distribution of those sources and unequal consumption of water by the global community means fresh water is scarce in many parts of the world, including Hong Kong.

Against this background, it is reasonable to ask why our government does not treat fresh water as the valuable and scarce resource it is.

### Uneven water consumption

Each year in *The World's Water*, tables of comparative national water consumption levels are published. These tables graphically illustrate the difference in consumption rates between the higher and lower consuming nations. For the most part, developed countries consume more per capita than the poor, developing countries, which is clearly unjust. Examples (from *The World's Water* (Vol.8)) are as follows.

Region	Country	Year	Total Freshwater Withdrawal (km <sup>3</sup> /yr)	Per Capita Withdrawal (m <sup>3</sup> p/yr)
AFRICA	Algeria	2001	5.70	161
	Angola	2005	0.70	37
	Benin	2001	0.13	14
	Botswana	2000	0.19	96
	Burkina Faso	2001	0.72	44
	Burundi	2000	0.29	34
	Cameroon	2000	0.97	49
	Cape Verde	2000	0.02	39
	Central African Republic	2005	0.07	16
	Chad	2005	0.88	76
	Comoros	1999	0.01	14
	Congo, Democratic Republic (formerly Zaire)	2005	0.68	10
	Congo, Republic of	2000	0.05	13
	Côte d'Ivoire	2005	1.50	70
	Djibouti	2000	0.02	23
	Egypt	2000	68.30	809
Equatorial Guinea	2000	0.02	29	
Eritrea	2004	0.58	111	
NORTH AND CENTRAL AMERICA	Cuba	2007	4.40	393
	Dominica	2004	0.02	301
	Dominican Republic	2005	5.50	538
	El Salvador	2006	3.50	243
	Haiti	2000	1.20	118
	Honduras	2006	2.10	276
	Jamaica	2000	0.41	150
	Mexico	2009	80.40	727
	Nicaragua	2001	1.40	240
	Panama	2000	0.91	259
	St. Lucia	2005	0.02	115
	St. Vincent and the Grenadines	1995	0.01	92
	Trinidad and Tobago	2000	0.23	171
United States of America	2005	482.20	1,518	
SOUTH AMERICA	Brazil	2006	58.07	297
	Chile	2007	26.70	1,558
	Columbia	2000	12.70	274
	Ecuador	2005	9.90	719
	Guyana	2000	1.64	2,154
	Paraguay	2000	0.49	76
ASIA	Afghanistan	2000	20.30	697
	Armenia	2007	2.90	938
	Azerbaijan	2005	12.21	1,367
	Bahrain	2003	0.36	442
	Bangladesh	2008	35.87	253
	China	2007	578.9	425
	Cyprus	2000	0.21	239
	Georgia	2005	1.80	427
	India	2010	761.00	627
	Indonesia	2000	113.30	487
	Iran	2004	93.30	1,243
	Iraq	2000	66.00	2,097
	Israel	2004	1.95	268
	Japan	2001	90.00	709
	Philippines	2009	81.6	872
	Qatar	2005	0.44	294
	Saudi Arabia	2006	23.67	902
	Singapore	1975	0.19	39
	Sri Lanka	2005	13.00	637

EUROPE	Czech Republic	2007	1.70	163
	Denmark	2009	0.66	120
	Estonia	2007	1.80	1,344
	Finland	2005	1.60	299
	France	2007	31.60	504
	Germany	2007	32.30	394
	Greece	2007	9.50	849
	Russian Federation	2000	76.68	546
	Serbia	2009	4.10	418
	Slovakia	2007	0.69	128
	Slovenia	2009	0.94	464
	Spain	2008	32.50	717
	Sweden	2007	2.60	280
	Switzerland	2000	2.60	342
	Ukraine	2005	19.20	423
United Kingdom	2007	13.00	210	
OCEANIA	Australia	2010	59.84	2,782
	Fiji	2000	0.08	94
	New Zealand	2002	4.80	1,115
	Papua New Guinea	2005	0.39	57

Another water usage graph (*The Statistics Portal*) shows the 10 highest per capita water consumers in 2016 were:

New Zealand – 2,162.3 m<sup>3</sup> (p/a)

United States – 1,158 m<sup>3</sup>

Estonia – 1,338.1 m<sup>3</sup>

Canada – 1,016.9 m<sup>3</sup>

Greece – 883.2 m<sup>3</sup>

Spain – 708.4 m<sup>3</sup>

Australia – 695.9 m<sup>3</sup>

Mexico – 678.8 m<sup>3</sup>

Turkey – 674.7 m<sup>3</sup>

Japan – 624.7 m<sup>3</sup>

However, it was reported in the *China Daily* (10 March 2008) that Hong Kong at that time had the highest per capita consumption:

“Hong Kong people use more water per capita than all other major cities in the world, according to an international study.

As revealed by the International Statistics for Water Services by the International Water Association Specialist Group on Statistics and Economics, per-capita water consumption was 219 litres per day (including 92 litres of seawater for flushing) in Hong Kong from 2005-06.

As for other cities, the per-capita daily consumption in Sydney in 2006 was 214 litres, 200 litres in Oslo, 170 litres in Helsinki and 160 litres in Singapore.

As pointed out by a consultant of the Water Supplies Department of the Hong Kong government, people shouldn't take the water supply for granted, and the territory should develop a water-management strategy with reference to new water resources, water conservation and protection of water resources.

Many water-supply infrastructures in Hong Kong were built more than 50 or 100 years ago, and they may need replacing, Peter Binney, director of national planning, global water business of consultant firm Black & Veatch, said yesterday.

However, water supply is subject to many factors, including climate change, flooding, rises in sea level and over-stretched water resources. To ensure a sustainable future, the analysts said Hong Kong should have a multi-faceted water-management strategy that includes repairing leaking pipes, identifying new supply sources and using less water.

Alan Man, the firm's director of client services, noted that the water supply from the mainland accounted for 80 percent of the water supply in Hong Kong. He also said local people consume more water than people in other international cities, due perhaps to lower water charges than other places. “We need serious thinking on whether the mainland water supply will be uninterrupted and whether we should consume less water,” he said.”

### *Water supply and consumption in Hong Kong*

#### *Supply*

Water rationing regularly applied in Hong Kong until the 1960s. In 1963-1964, supply was so limited that people had access to water for only 4 hours every 4 days.

The government therefore devised a three-pronged approach secure adequate fresh water supplies:

- (i) construction of more reservoirs, especially by in-filling coastal bays;
- (ii) switching flushing of toilets to seawater; and
- (iii) reaching agreement with China for water to be diverted annually from Dongjiang, Guangdong.

Even with the steady implementation of these measures, water was rationed occasionally until 1981.

#### *Seawater*

Installation of infrastructure to use seawater for flushing was in fact begun in 1955 and has been steadily extended to now provide approximately 80% of all flushing water. Supply of seawater is unlimited, but there is a cost involved in using it, as discussed below.

## Freshwater

Approximately 20-30% of Hong Kong's fresh water is sourced from the expanded reservoirs system, mainly: Shek Pik (1963); Plover Cove (1968); and High Island (1978), and from Dongjiang.

The history and present status of the Hong Kong/Guangdong water agreement was summarised in *Research Brief* (Issue No.5, 2014-2015) prepared and published by the Research Office of the Legislative Council Secretariat:

“Since 1960, Hong Kong has entered into a number of water supply agreements with Guangdong to meet its water demand. This included the 1965 agreement that formally started the importation of raw water from Dongjiang. During the early years, Hong Kong sourced about 20%-30% of its total water supply from Dongjiang. The percentage share has increased progressively since then and reached about 70%-80% in recent years. While securing a stable fresh water supply for Hong Kong, Dongjiang incurs a higher production cost than rainwater. In 2013-2014, the unit cost of fresh water produced from Dongjiang water amounted to HK\$8.6/cu m, of which HK\$4.6 was the cost of raw water and HK\$4.0 the processing cost.

Since 2006, the “package deal lump sum” approach has been adopted to allow the flexibility in adjusting the amount of Dongjiang water piped to Hong Kong on a monthly basis. Under the approach, an annual lump sum payment is made to Guangdong in exchange for a reliable supply of Dongjiang water up to the annual supply ceiling specified in the water supply agreement. Yet the actual draw-down is determined by WSD each month after taking into account local reservoir and rainfall conditions. This flexibility aims to achieve a better control of the storage level in Hong Kong and minimize water overflow.

A new three-year water supply agreement was signed in May 2015 under which Guangdong provides a maximum of 820 million cu m of raw water to Hong Kong annually. The agreement also allows Hong Kong the flexibility to raise the annual supply ceiling to 1,100 million cu m. This ultimate annual supply ceiling was first set out in the water supply agreement signed in 1989, as well as in the *Water Resources Distribution Plan in the Dongjiang River Basin of Guangdong Province* promulgated by the Guangdong authorities in 2008. The *Distribution Plan* sets out the maximum amount of water Hong Kong and seven Guangdong cities can draw from Dongjiang (Table 1).

**Table 1 – Water Resources Distribution Plan in Dongjiang River Basin**

	Allocated annual quantity		Reliance on Dongjiang
	under normal yield	under drought	
Hong Kong	1100	1100	~ 70%-80%
Dongguan	2095	1944	~ 90%
Shenzhen	1663	1608	~ 70%-80%
Heyuan	1763	1706	~ 90%
Huizhou	2533	2405	~ 70%
Shaoguan	122	113	as a supplementary source of water supply only
Meizhou	26	22	
Guangzhou	1362	1285	
<b>Total</b>	<b>10664</b>	<b>10183</b>	-

(million cu m)

Sources: Water Supplies Department, 廣東省人民政府辦公廳, 東莞市水務局, 深圳市水務局, 惠州市水務局 and 河源網.

During 2006-2013, the annual flow of Dongjiang averaged at 25.4 billion cu m, which was 23% lower than the long-term annual average of 33.1 billion cu m during 1956-2005. In addition, Dongjiang has been under increasing strain as it supports as many as 40 million people in Hong Kong and the seven cities in Guangdong. Looking ahead, Dongjiang is expected to be subject to a bigger challenge under a long-term development plan up to 2020 as promulgated by the National Development and Reform Committee in early 2009. The plan focuses on, among other things, the development of the Pearl River Delta as a world-class industrial base for advanced manufacturing industries. This will inevitably add further pressure to water demand in the Dongjiang-reliant cities. Reflecting this, Dongguan, Shenzhen and Huizhou are forecast to exceed their allocated quantities of Dongjiang water under the Distribution Plan by 20%, 56% and 18% respectively in 2020.

Notwithstanding the above, Hong Kong is guaranteed a stable supply of Dongjiang water during 2015-2017 under the new water supply agreement signed in May 2015. Yet there is no assurance that Dongjiang will always be able to provide a constant water supply for Hong Kong should extreme climate conditions in the Mainland lead to greater competition for Dongjiang water among the various cities of Guangdong. To prepare for this possibility and serve as a responsible user of Dongjiang, it is prudent for Hong Kong to conserve water and review and explore the various options for sources of water supply.”

## Desalination

Freshwater was produced by the Lok On Pai desalination plant between 1975 and 1981, when it was decommissioned because water from China was cheaper. However, the government plans to construct at Tseung Kwan O a new desalination plant, to be operational by 2020 with an annual capacity of 50 million m<sup>3</sup>, which could be doubled in the future.

## Consumption

The *Research Brief* notes:

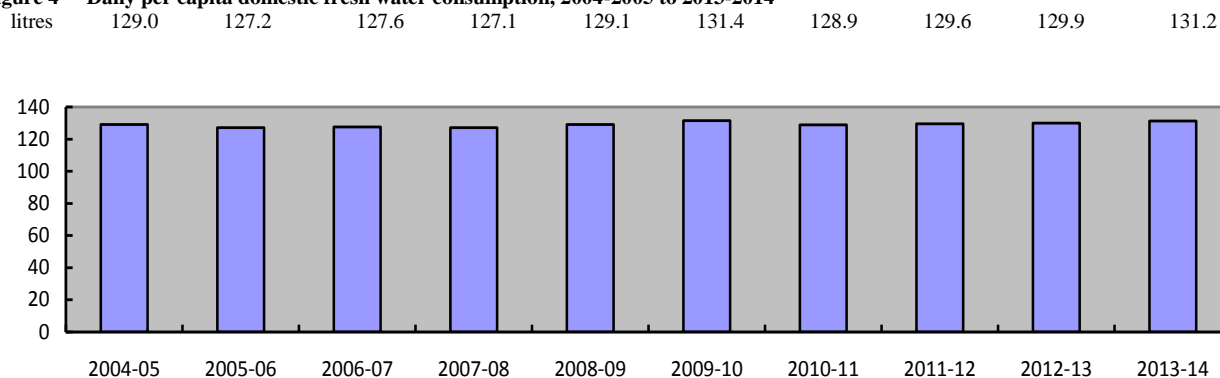
“Low water tariff, coupled with a stable supply, has led to Hong Kong being one of the highest per capita water users in the world. According to a study conducted by the International Water Association in 2014, Hong Kong's domestic per capita water consumption stood at 209 litres/day in 2012. The figure was higher than that in many other global cities like Singapore (152 litres) and London (163 litres).”

These figures include the use of seawater by 80% of the population for flushing. In 2013-2014, the average per capita daily flushing volume (whether seawater or fresh water) was 96.7 litres.

The *Research Brief* comments on Hong Kong's per capita, daily fresh water use as follows:

“Hong Kong's per capita domestic fresh water consumption remained at around 130 litres/day between 2004-2005 and 2013-2014. This was 18% higher than the world average of 110 litres, and notwithstanding the implementation of various water conservation initiatives under the Total Water Management (“TWM”) Strategy promulgated by WSD in 2008 (Figure 4). As a long-term strategy for the period up to 2030, the TWM Strategy aims at achieving an optimal balance between water demand and supply to support sustainable development in Hong Kong. It focuses on containing the growth of water demand through conservation initiatives such as water efficiency labelling scheme (“WELS”) and use of water saving devices.”

**Figure 4 – Daily per capita domestic fresh water consumption, 2004-2005 to 2013-2014**



World average: 110 litres  
Source: Water Supplies Department<sup>2</sup>

Domestic consumption amounts to only approximately 30% of Hong Kong’s total, yearly water consumption; the rest is used by industry and consumer services (e.g. hotels and restaurants).

Plainly we are high-volume users of water, but by levying low water charges and refraining from mandating water-saving measures, the government has not encouraged water conservation practices.

#### Cost of water for Hong Kong consumers

The Water Supplier Department (2013-2014) estimated the cost (per cubic metre) of “producing” our water supplies as:

- Rainwater (i.e. reservoirs): HK\$4.00
- Dongjiang water: HK\$8.60
- Desalinated water: HK\$12.00-13.00
- Reclaimed water for non-potable use: HK\$9.80
- Seawater (for flushing): HK\$3.40

However, water charges levied by the government have traditionally been disproportionately low – as they remain today. This, of course, encourages water-wastage, rather than conservation of our limited fresh water resource. The *Research Brief* made this point very plainly.

“Hong Kong’s water tariff is among the lowest in the world. Seawater flushing is free and the use of fresh water for toilet flushing will be billed only if it is in excess of 30 cu m for a four-month period<sup>1</sup>. For fresh water supply, domestic users are charged through a subsidized four-tiered system and they only need to pay water tariff every four months<sup>2</sup>.

The fresh water pricing scheme was last reviewed in February 1995. At that time, the first tier provided up to 12 cu m of fresh water free and the second tier was subsidized by government rates. Only when the domestic customer reached the third tier of pricing did the water tariff reflect the actual production cost. For the fourth tier, it was charged at a punitive rate roughly 40% above the third tier rate (Table 2).

**Table 2 – Hong Kong’s fresh water pricing scheme adopted in February 1995**

Category	Water pricing (HK\$ per cu m)
<b>Domestic use</b>	
First tier (first 12 cu m)	Free
Second tier (next 31 cu m)	4.16 (subsidized rate)
Third tier (next 19 cu m)	6.45 (cost recovery rate)
Fourth tier (for the remainder)	9.05 (punitive rate)

Source: Water Supplies Department.”

Even though the price of Dongjiang water more than doubled from HK\$2.20 per m<sup>3</sup> in 1995 to HK\$4.60 per m<sup>3</sup> in 2013, the 4 tiers pricing scheme has remained unchanged since 1995. The government is (yet again) mainly generously subsidising businesses by keeping water tariffs unrealistically low. A telling comparison with several other major urban centres highlighted in the *Research Brief* reveals how absurd the low tariff, approach is, particularly in the context of implementing a more enlightened, responsible approach to the community’s water usage habits:

	City	Fresh water tariff (US\$ per 100 m <sup>3</sup> )
A.	Geneva	366.17
	New York	287.62
	London	258.76
	Paris	203.40
	Tokyo	141.65
	Seoul	53.48
B.	Hong Kong	33.80

The government should adopt a more realistic pricing scheme for water if we are to make any headway in lowering our high consumption rates. There are also water-saving measures the government could implement.

<sup>1</sup> Any consumption of fresh water for toilet flushing above the level of 30 cu m per flat is charged at HK\$4.58/cu m. For metering of the quantity of fresh water used, there is only one meter installed in each building to record the total consumption of all flats in the same building.

<sup>2</sup> Non-domestic users are charged at a flat rate per cu m of water consumed.

## Water conservation measures

More enlightened administrations in other countries have long recognised the environmental – and economic! – benefits of reducing water consumption. Some examples of water-saving measures, other than using seawater, which, to its credit, the government already extensively does, are as follows.

### Water-saving devices

Quite simple and relatively cheap water-saving devices are widely employed in many countries. These include:

- (i) dual-flush cisterns
- (ii) low-flow showerheads
- (iii) flow-limiting taps
- (iv) flow control valves and restrictors

Singapore and all Australian states and territories, for example, require new and renovated dwellings to install dual-flush cisterns, which significantly reduce flushing water usage.

Again, in Singapore and Australia new/renovated premises must use water fittings and products carrying water efficiency ratings in accordance with their *Water Efficiency Labelling Schemes* (WELS).

Such measures are simple, inexpensive and non-controversial; yet the relevant administrators here display their usual inertia when it comes to actually *initiating* conservation processes.

### WELS

We have a WELS, but it is a voluntarily conservation process covering bathroom/laundry equipment and water delivery systems. As said, other jurisdictions mandate compliance with WELS specifications. Some Australian state governments also subsidise the cost of installing water efficient appliances.

### Improved prevention of pipe leaks

There are more than 8,000 km of mains water pipes (i.e. excluding pipes located in premises). A significant proportion of these are more than 30 years old, so the leakage rate is comparatively high: e.g.

- Hong Kong (2014) – 16%
  - Tokyo – 2%
  - Seoul – 5%
  - Sydney – 8%
- (from *Research Brief*)

The government has implemented a territory-wide programme to replace leaking mains pipes, but more needs to be done, and faster.

### Reduce reservoir spillages

In periods of heavy rainfall, some of Hong Kong's smaller reservoirs overflow. The volume of overflow per year between 2009 and 2014 averaged 19.8 million m<sup>3</sup>, which was approximately 35% of the combined capacity of the small reservoirs.

The *Water Supplies Department* announced in 2004 a plan to mitigate overflows by installing infrastructure to enable transfer of water between the reservoirs. However, the plan is yet to be implemented.

### Conclusion

Conserving water makes economic as well as environmental sense, particularly for Hong Kong, which has very limited natural fresh water resources.

In the larger environmental picture, reducing water consumption levels allows more water to be retained for the benefit of our ecosystems which are water-dependant, such as wetlands (which have been halved in size world-wide due to excessive water use and extraction).

Hopefully, our government will one day realise that it has a responsibility to correct our traditional water-wasteful ways.

## LEGISLATION DIGEST

### *Air Pollution Control (Fuel for Vessels) Regulation (Cap.311AB)*

The *Air Pollution Control (Fuel for Vessels) Regulation* (the “New Regulation”) has been published by the Environmental Protection Department. The New Regulation requires that all vessels use compliant fuel within the waters of Hong Kong so as to reduce their emissions and improve air quality.

The *Air Pollution Control (Ocean Going Vessels) (Fuel at Berth) Regulation (Cap. 311AA)* (the “*Fuel at Berth Regulation*”) have been in operation since 1 July 2015. They require that ocean-going vessels (“OGVs”) switch to compliant fuel while berthing in Hong Kong, to reduce their emissions. The New Regulation extends the mandatory use of compliant fuel – including low-sulphur marine fuel (of a sulphur content not exceeding 5%), liquefied natural gas or any other approved fuel – to all vessels within the waters of Hong Kong.

Under the New Regulation, all vessels are required to switch to compliant fuel before entering Hong Kong waters; and the masters and owners of these vessels are required to record the date and time of fuel switching and to keep relevant records for three years. The masters and owners who fail to use compliant fuel within Hong Kong waters will be liable to a maximum fine of \$200,000 and imprisonment for six months; whereas those who fail to record or keep the required particulars will be liable to a maximum fine of \$50,000 and imprisonment for three months. The New Regulation mainly affects OGVs that are using heavy fuel oil (with an average sulphur content of 2.6%).

It is anticipated that implementing the New Regulation will eliminate approximately 6,340 tonnes of SO<sub>2</sub> and 710 tonnes of respirable suspended particulates emissions in Hong Kong from marine vessels in 2020 compared with 2015 emission levels. Implementation of the New Regulation will also enhance regional collaboration with the mainland on the establishment of a domestic emissions control area in the Pearl River Delta.



As the scope of the *Fuel at Berth Regulation* is covered by the New Regulation, it will be repealed upon the commencement of the New Regulation. The New Regulation will take effect on 1 January 2019.

### ***Product Eco-Responsibility (Regulated Electrical Equipment) Regulation (Cap.603B)***

The *Product Eco-Responsibility (Regulated Electrical Equipment) Regulation* (the “Regulation”) came into effect on 1 August 2018. The Regulation provides the necessary operational details for its enabling legislation, i.e. Part 4 of the *Product Eco-responsibility Ordinance (Cap.603)*.

The new regime imposes certain duties on suppliers and sellers of “Regulated Electrical Equipment” (“REE”) to enhance their eco-responsibilities under *Producer Responsibility Scheme* which the Environmental Protection Department (“EPD”) has been promoting for a decade.

REE covers air-conditioners, refrigerators, washing machines, televisions, computers, printers, scanners and monitors.

Under the new regime, an REE supplier must apply for registration with the EPD before distributing the REE pursuant to Part 2 of the Regulation. After registration, the supplier will then be subject to continuing obligations to pay recycling levies, to submit returns and to submit annual audit report in accordance with the Regulation.

An REE seller must have a removal service plan endorsed by the EPD before selling REE, failing which constitutes an offence and the seller is liable to a fine. The seller is obliged to arrange a removal service for a customer who purchases REE, to dispose of the old REE item. The designated licenced collector engaged by the seller will remove the waste equipment as requested by the customer to a designated recycler for proper treatment. Further, the seller is required to provide the customer with a recycling label in respect of each REE item and a receipt showing the recycling levies, in order to show compliance with the Scheme.

Currently, most distributors engage Alba to provide waste recycling services; and it will only remove the waste equipment upon appointment made 3 working days in advance. Customers who want to have their new equipments delivered and their waste equipment removed on the same day may have to pay an extra HK\$100 to “upgrade” the recycling service or make a special request with the distributor to do so.

## **TOWN PLANNING**

### **Aberdeen & Ap Lei Chau Outline Zoning Plan approved**

On 31 August 2018, the Chief Executive in Council approved the draft Aberdeen & Ap Lei Chau Outline Zoning Plan.

The Planning Scheme Area of the OZP, covering about 783 hectares, includes Tin Wan in the west and part of Aberdeen Country Park in the north. To the east, it is bounded by the approach road to Aberdeen Tunnel, Wong Chuk Hang Road and Island Road. To the southwest, the area covers the islands of Ap Lei Chau and Ap Lei Pai.

Specific Zones are:-

- (1) 1.49 hectares are zoned “Commercial” for commercial developments, which may include supermarkets, shops and services, and eating places, functioning mainly as local or district shopping malls serving the immediate neighbourhood of South Horizons and the Southern District;
- (2) 7.17 hectares are zoned “Comprehensive Development Area” for residential and commercial uses together with a rail depot and station with the provision of public transport and other supporting facilities;
- (3) 60.84 hectares are zoned “Residential (Group A)” for high-density residential developments;
- (4) 0.40 hectare is zoned “Residential (Group C)” for low-rise, low-density residential developments;
- (5) 3.48 hectares are zoned “Residential (Group E)” for phasing out of the existing industrial uses in Tin Wan, Aberdeen and Ap Lei Chau through redevelopment or conversion for residential use;
- (6) 5.91 hectares are zoned “Industrial” for general industrial uses;
- (7) 15.51 hectares are zoned “Open Space” for the provision of outdoor open-air public space for active and/or passive recreational uses;
- (8) 101.99 hectares are zoned “Government, Institution or Community” for the provision of a wide range of government, institution and community facilities to serve the needs of local residents and/or a wider district, region or the territory;
- (9) 106.19 hectares are zoned “Other Specified Uses”;
- (10) 213.09 hectares are zoned “Green Belt” for defining the limits of urban and sub-urban development areas by reference to natural features, to protect the natural landscape and environment, and to provide a countryside recreational outlet for the local population and visitors;
- (11) 28.35 hectares is zoned “Coastal Protection Area” to conserve, protect and retain the natural coastlines and the sensitive coastal natural environment;
- (12) 1.98 hectares are zoned “Site of Special Scientific Interest”; and
- (13) 101.73 hectares are zoned “Country Park”.

[Town Planning Board Press Release, 31/08/2018]

### **Tai Po Outline Zoning Plan approved**

On 31 August 2018, the Chief Executive in Council has approved the draft Tai Po Outline Zoning Plan (OZP) to guide the development and redevelopment within the Tai Po area.

The Planning Scheme Area of the OZP, covering about 2438 hectares, is encircled on three sides by the mountain ranges of Pat Sin Leng, Cloudy Hill, Tai Mo Shan and Grassy Hill. To the east, the coastline of Tolo Harbour forms its natural boundary. The Area can be broadly divided into three physical areas, namely Tai Po Hui and its adjacent reclamation; the valley floors and lower hillsides to the north and south; as well as the steep upper hillsides in the peripheral areas.

Specific Zones are:-

- (1) 108.48 hectares are zoned “Residential (Group A)”;
- (2) 35.52 hectares are zoned “Residential (Group B)”;
- (3) 141.04 hectares are zoned “Residential (Group C)”;
- (4) 0.73 hectares are zoned “Residential (Group D)”;
- (5) 18.37 hectares at Fung Yuen is zoned “Comprehensive Development Area (1)” for comprehensive development/redevelopment for low-density residential and agricultural uses with the provision of open spaces and other supporting facilities;
- (6) 150.35 hectares are zoned “Village Type Development” to reflect existing recognised traditional villages plus other villages, and to provide land considered suitable for village expansion;
- (7) 172.12 hectares are zoned “Government, Institution or Community”;
- (8) 65.77 hectares are zoned “Open Space” for the provision of outdoor open-air public space for active and/or passive recreational uses;

- (9) 3.75 hectares are zoned “Recreation Priority Area” for eco-tourism related recreational developments;
- (10) 188.74 hectares are zoned “Other Specified Uses” for specific uses which mainly include railway stations and railway track, business, golf course, industrial estate, and historical building and site, etc.;
- (11) 43.50 hectares are zoned “Site of Special Scientific Interest” to conserve and protect the features of special scientific interest;
- (12) 75.49 hectares are zoned “Conservation Area” to protect and retain the existing natural landscape, ecological or topographic features;
- (13) 5.73 hectares are zoned “Country Park”; and
- (14) 1262.54 hectares are zoned “Green Belt” for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets.

[Town Planning Board Press Release, 31/08/2018]

## WEST KOWLOON CULTURAL DISTRICT

### M+ Museum builder sacked

The West Kowloon Cultural District Authority (the “Authority”), managing Hong Kong’s multibillion-dollar arts hub, has fired its cash-strapped main contractor.

On 17 August 2018, the Authority terminated the HK\$5.9 billion contract (for construction of the M+ visual culture museum) with Hsin Chong Construction Limited (“Hsin Chong”) due to the company’s insolvency, which was caused by “severe financial troubles” faced by the parent company Hsin Chong Group Holdings Limited. According to its annual report last year, it lost HK\$774 million for the year and failed to repay HK\$3 billion in overdue debts

A spokesperson for the Authority openly criticised Hsin Chong for failing properly to manage its contract. He also added that the company’s poor management had led to significant delays on site.

With regard to concerns over the quality of the work, the Authority reassured the public that on-site staff, independent administrators and architects had been monitoring the project.

[SCMP, 18/08/2018]

### M+ contractor responds

A spokesperson for Hsin Chong Construction Limited (“Hsin Chong”), the former M+ Museum contractor, claimed that its financial problems had nothing to do with delayed construction and put the blame for delays in construction of the M+ Museum squarely on the West Kowloon Cultural District Authority .

In a letter to lawmakers, Hsin Chong claimed that the delays were largely because the Authority has made a large number of alterations to the original design plans. Hsin Chong also accused the Authority of hacking its computers and gathering staff data without permission, including ID numbers and medical details.

The M+ Museum, with a new main contractor, is now scheduled to open in 2020, which is one year later than initially planned. The Authority, which manages the multi-billion-dollar arts hub, terminated Hsin Chong’s contract last month due to its poor financial problems. According to filings to the Hong Kong Stock Exchange, Hsin Chong’s parent company, Hsin Chong Group Holdings Limited, had fallen behind on debt payments. Its shares had been suspended from trading since April 2017. In view of the poor financial situation of Hsin Chong, the Authority had to pay HK\$1.6 billion directly to subcontractors working on the M+ Museum over the course of 18 months, so as to keep construction going.

At a special meeting of the Legislative Council on 11 September 2018, a spokesperson for the Authority responded to Hsin Chong’s claims. He stressed that the Authority was not to be blamed for construction delays. He pointed out that the Authority had been aware of the financial difficulty facing the Hsin Chong Group Holdings Limited for a number of months. However, the Authority could not terminate a contract with its main contractor unless and until it had gathered solid evidence that the contractor was in financial trouble.

[The Standard, 12/09/2018]

## HONG KONG BRIEFING

### Air pollution is a cancer risk

In the air which we breathe every day, there are pollutants from vehicle exhaust gases and emissions from factories and coal-burning power plants. Those that we can breathe in include particulate matter (PM10, PM2.5), nitrogen dioxide, ozone, sulphur dioxide and other toxic gases.

PM2.5 (i.e. particulates of a diameter less than 2.5 µm), is the main concern of medical professionals. When these tiny particulates enter the nasal cavity, they provoke rhinitis and can also enter the lungs via the trachea and blood, affecting cardiopulmonary health. In the long term, the risks of having chronic lung diseases, cardiovascular diseases, lung cancer and even early death are inflated from exposure to Hong Kong’s high air pollution levels.

The nasal cavity is the first to be affected by polluted air. “If there is a vast amount of pollutants (e.g. PM) in the air, the first to be affected is the nasal cavity. The pollutants will be carried in the air that we inhale into our nasal cavity, stimulating the nasal mucosa and hence swelling and inflammation there arise, allergic rhinitis is particularly common”, Otorhinolaryngology specialist, Dr. Kin Ming Chan, said.

The rhinitis caused by air pollution is unrelated to sources like pollens or dust mites. From his clinical practice, Dr. Chan noticed there is a close relationship between the city environment, where the patient usually resides, and the seriousness of the patient’s condition. “In a classic and common case, when a patient with rhinitis went to study abroad in a city where air pollution level is low, his condition became less serious or the disease is cured naturally. On the other hand, some patients only started to suffer from allergic rhinitis after moving to cities like Beijing, Shanghai to work where there was heavy smog. If they are rhinitis patients, their conditions can only become worse there. At night, especially, they will suffer from postnasal drip syndrome, stuffy nose, breathing difficulty etc. thus poor sleeping quality is resulted. In this way, they won’t have enough energy for daily work due to the lack of sleep and will be more vulnerable to suffer from cold because of low immunity,” he explained.

Those experiencing allergic rhinitis as a result of severely polluted working and living environments require long-term prescriptions for controlling their illness. They start to recover only after giving up their work and relocating to where there is cleaner air.



Dr. Chan has also observed that there is a rise in the number of patients with pharyngitis on heavily polluted days. He added, “they turn to mouth for breathing since they cannot do so properly with a stuffy and sick nose. Consequently, the pollutants in the air are taken in into the pharynx, leading to inflammation, pain in the throat and accumulation of mucus there.”

Aside from these, asthma can be induced by air pollution. Symptoms such as tightened bronchi and difficulty in breathing can be easily triggered by external stimulant, i.e. air pollutants, in patients suffering from asthma. This can be deadly if they are not treated promptly.

As well as immediate and short-term impacts on the respiratory system, the functioning of the cardiopulmonary system can be adversely affected in the long term from inhaling air pollutants. “PM2.5 pollutants are very tiny; they can pass through the respiratory barrier and enter the lungs. The elderly, with declining functioning of the body, are more susceptible. Patients with chronic lung disease e.g. bronchi dilation, chronic bronchitis are especially vulnerable as well”, Dr. Chan said.

In addition to the elderly, extra care should be taken for children. Researcher, Prof. Tze Wai Wong, from The Hong Kong Jockey Club School of Public Health and Primary Care at the Chinese University of Hong Kong, pointed out that if children are exposed to a heavily polluted environment for a long time, their vital organs capacity will be adversely affected. Research in Hong Kong and other countries has also established that the vital capacity of children living in heavily polluted cities was smaller, possibly affecting the proper growth and health of their lungs.

“It has long been proved in the medical industry that there is an obvious relationship between PM2.5 and the risks of having lung cancer. This is caused by a carcinogenic substance called PAH (Polycyclic Aromatic Hydrocarbons) in particulate matter. They often come from diesel car exhaust or factory emissions,” he continued, “On top of that, when PM2.5 enters the blood, the inner wall of blood vessels will be stimulated, inducing blood clotting which can lead to blockage in the cardiovascular vessel and thus heart disease. Therefore, the risk of early death from having heart and chronic lung disease will be raised when inhabiting an environment with high PM2.5 concentration.”

[*Clean Air Network*, 29/06/2018]

### Land swap illustrates flawed land policy

“The extraordinary decision by the Executive Council to approve a Cheung Kong subsidiary firm’s demand to exchange 23 Coombe Road – a dilapidated bungalow in a dark, cramped site – for a massive concrete platform in our green belt with spectacular billionaire views over country park and open seas, is yet another example of the charade of our land policy.

The sorry saga started in 2010 when the Antiquities Advisory Board upgraded this unknown, nondescript property – bought by Juli May, a Cheung Kong Group subsidiary for HK\$27.5 million in 1993 – from nothing to provisional Grade 3 and then to Grade 1, setting in place a highly convenient series of steps, with minimal transparency.

The Town Planning Board’s cavalier disregard for the arguments of 3,000 petitioners, community groups and several government departments objecting to this crude land grab simply beggars belief.

Valid concerns, ranging from proximity to the much-used entrance to Aberdeen Country Park, to damage to one of the largest black kite roosts in East Asia and our endangered *Artocarpus* trees, were rejected without comment. The logical solution of building this single property in the bungalow’s own grounds was simply ignored.

Surely we are at a point where Hong Kong has progressed beyond such cosy collusion between government and the influential, especially when it comes to the handling of such a sensitive public amenity that is enjoyed by so many.

Juli May should withdraw its shameful application, build its large house in the bungalow grounds and avoid many more years of public resistance and embarrassment.”

[*SCMP*, 15/07/2018

(letter to editor from Richard Winter, Coombe Road)]

### Invasive fish species harm local ecosystems

“Invasive fish species pose a problem to our dams, lakes, and rivers, but not much attention is given to addressing the issue (“More action urged on potentially invasive alien wildlife in Hong Kong”, March 24). Piranhas, African catfish, pirarucu (*Arapaima gigas*), peacock bass and tilapia, to name a few, are all found in abundance in waterways, and some are bred in ponds for aquaculture projects.

Lately, news has surfaced of the discovery of two new foreign predatory fish known as the eartheater and the black ghost knifefish. Experts warn about the devastating implications these aquatic nuisance species have on waterways and aquatic life.

Ecosystems around the world have been dramatically altered as fish species are introduced, whether for commercial fishing stock or the aquarium trade. Humans are experts at helping species move from their native habitat into new memory. But the new habitat may suit the invader fish so well that they are able to multiply rapidly and wipe out many of our native river species.

Reversing the damage is challenging and at times unsuccessful. Prevention is the key to avoiding invasive threats to native aquatic ecosystems.

It may seem humane to set Nemo free in the ocean, but such impulses threaten native ecosystems. Even something as seemingly harmless as a goldfish can disrupt local food chains. Invasive species feed on fish eggs and small invertebrates, rooting up plants while swimming and releasing nutrients that trigger excess algal growth.

Certain freshwater fish species used for recreational angling are released into rivers, dams and lakes without an environmental impact assessment or monitoring. This practice has become so widespread that people often think that some of the invasive species are actually native ones.

Management of invasive fish species requires urgent attention, and *Friends of the Earth Malaysia* calls on government fisheries departments to:

- enforce the law in dealing with those found to be importing, selling and keeping alien predator fish.
- halt the introduction of invasion species solely for the pursuit of recreation.
- ban aquarium shops and fish farms from importing invasive species that are a direct threat to native aquatic ecosystems.

Community participation, education and awareness are crucial in halting the spread of invasive species.”

[SCMP, 15/07/2018]  
(letter to editor from S.M. Mohd Idris,  
president, *Friends of the Earth Malaysia*)

### **Hong Kong's power suppliers upgrade a clean energy connection with China**

CLP Power's five-year development plan to upgrade a "clean energy" transmission system connected to Guangdong province has recently been approved by the Executive Council.

According to the Environment Bureau, the upgraded system is flexible enough to allow Hong Kong to use more zero carbon energy from the mainland, which should hasten the pace to achieve the government's carbon emissions reduction targets for 2030 by five years. Chiang Tung Keung, managing director of CLP, said the upgrade is not expected to be completed until 2025, due to the long distance of about 160km.

However, environment and energy experts expressed concern regarding the lack of details in the government's report, especially when Mr. Wong Kam-sing, the environment minister, failed to define the source or nature of the "zero carbon clean energy" specified in the report.

A public engagement process will later be conducted by the Council for Sustainable Development to study a long-term decarbonisation strategy.

[SCMP, 04/07/2018]

### **Commencement of producer responsibility waste scheme**

The Producer Responsibility Scheme on Waste Electrical and Electronic Equipment (WEEE) came into effect on 1st August 2018. The new scheme covers air-conditioners, refrigerators, washing machines, televisions, computers, printers, scanners and monitors (collectively referred to as regulated electrical equipment, or REE) and aims to improve Hong Kong's waste reduction and recycling programme.

The new programme requires REE sellers to provide customers who purchase a new item of REE with a free removal (of the old REE item) service. The corresponding recycling label, as well as the sold REE and a receipt showing the prescribed wording for recycling levies must be provided to indicate the purchased REE is correctly supplied in accordance with WEEE.

A treatment and recycling facility (WEEE • PARK) has provided additional manpower to attain its performance pledge for collecting the waste equipment three working days after receipt of the service request from the sellers. No extra fee is to be paid by buyers for the REE removal.

Meanwhile, the Environmental Protection Department (EPD) has been authorised to closely monitor the performance of the operator. To ensure a smooth operation, the EPD will contact corresponding industry representatives in due course to check on implementation of the scheme and to arrange any necessary improvement. Follow-up investigation and enforcement actions regarding non-compliance by the sellers will take place regularly.

Until 31<sup>st</sup> July 2018, the EPD had already received 2,562 applications for endorsement of removal service plans (RSP) by REE sellers and almost 70% of the applications had been approved. Meanwhile, 173 out of 219 applications for supplier registration have also been approved.

[HKSAR Government Press Releases, 01/08/2018]

### **Reusable containers to fight Hong Kong's rubbish problem**

Whilst stacks of plastic forks and food containers are too often ignored, the "Have a Plastic-Free Day" campaign in Cheung Chau has encouraged visitors to use reusable lunchboxes, chopsticks and forks, which can be borrowed from participating food outlets by paying a refundable cash deposit of HK\$20.

Since August 2018, this offer has been available every weekend. The reusable containers, which are made of silicon, are cleaned and reused. Until now, 20 local snack bars and restaurants have agreed to offer discounts or extra food to customers who use the containers. According to the organisers, approximately 120 meal boxes were borrowed during the first three hours of the campaign.

[SCMP, 11/08/2018]

### **Umbrella covers add to plastic pollution**

A local green group yesterday accused the government of "taking the lead" in producing waste by giving out plastic bags for umbrellas during rainy days at buildings it manages. Greeners Action urged the government to impose a levy on plastic covers for umbrellas similar to the 50 HK cents retail outlets charge for plastic bags.

The group said it investigated 83 buildings managed by the Leisure and Cultural Services Department from July to August, and found 60 of them gave out plastic bags for umbrellas on rainy days. Most handout points lacked any guidance for users, except for one building that had a sign asking people to "make better use of umbrella bags".

"We are very disappointed that while the government has been encouraging citizens to adopt a greener lifestyle, some departments have failed to follow their own environmentally friendly policies," Greeners Action's Yip Chui-man said.

In 2016 – the last year for which statistics are available – plastic comprised one-fifth of the 10,345 tonnes of municipal waste sent daily to landfills. The 2,000 or so tonnes of plastic waste is roughly equivalent to the weight of 135 double-decker buses.

According to Yip, the department in each of its annual reports from 2009 to 2016 said it would "seriously review" the need to provide umbrella bags. She added plastic recycling bins were supposed to be provided to collect the used bags. Yip described this assurance as "not consistent with reality", noting the group had found only 10 buildings with such recycling bins.

[SCMP, 24/08/2018]

### **Plastic recycling trial**

A trial scheme to boost Hong Kong's dismal waste plastic recycling rate will take place next year to three districts. The government will pay for recyclers to collect waste plastic from private and public residences, schools, public offices and government-run recycling centres.

The recycle contractors, hired by the Environmental Protection Department, will be required to sort, shred, clean and melt the used plastic to produce regenerated materials or products for local or overseas markets. Tenders will be called later this year. Chief Secretary Cheung Kin-chung did not say which three of the city's 18 districts would be involved.

Currently, private buildings handle their own recycling while the government has set up bins in public areas for disposal of waste plastic, metal and paper. The authorities are also aiming to launch a municipal solid waste charging scheme late next year.

In the past three years, more than 2,000 tonnes of plastic have been sent to landfills on a daily basis, accounting for about 20 per cent of all the municipal solid waste produced by the city's population of 7.3 million.

As the mainland stopped importing used plastic, as part of its ban on 24 types of solid waste imposed earlier this year, the city's recyclers no longer have a ready destination to send the waste.

Recyclers were concerned as to whether there would be enough space to store the waste and whether they could collect enough plastic to sustain operations. Jacky Lau Yiu-shing, director of the Recycle Materials and Re-production Business General Association, said the two melting machines his recycling company owned needed a space of 20,000 sq. ft. Leung Hin-fai, owner of recycling company Leung Fai Kee, said 10 flexible bulk containers filled with used plastic could take up 500 sq. ft. to 600 sq. ft.

Lau said: "Would the government consider giving recyclers the land restored from closed landfills to build recycling factories?"

He added: "If we could collect no less than 30 tonnes of used plastic every day, then the recycling cost could be controlled at or even below HK\$3,000 per tonne. Considering that the regenerated plastic particles could be sold for between HK\$5,000 and HK\$8,000 per tonne, there is still room for profit if the supply of waste is sufficiently stable."

[SCMP, 27/08/2018]

## ADVISORY COUNCIL ON THE ENVIRONMENT (ACE)

### Summary of the 230<sup>th</sup> Meeting of the ACE held on 5 March 2018

#### Proposal to tighten emission standards for non-road vehicles

##### *Background*

With a view to improving air quality and public health, the *Air Pollution Control (Vehicle Design Standards) (Emission) Regulation (Cap.311J)* (the "Road Vehicle Regulation") and the *Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation (Cap.311Z)* (the "Non-road Mobile Machinery Regulation") were enacted during the past decade to control emissions of road vehicles and non-road vehicles.

Under the regime, all newly registered vehicles are required to comply with the prevailing emission standards prior to their use and a label is granted by the Environmental Protection Department ("EPD") to be affixed on each vehicle to certify compliance. Prosecution is to be initiated if any vehicle is found to operate without prior approval.

According to the *Non-road Mobile Machinery Regulation*, "non-road vehicles" are private cars, goods vehicles, buses that are powered by internal combustion engines and are intended to be used exclusively in the restricted areas of the airport, construction sites or container terminals.

##### *The proposal*

Amendments to the *Road Vehicle Regulation* were approved by the Legislative Council on 24 February 2017. The amendments tighten emission standards for newly registered road vehicles. As it has been the government's standing policy that prescribed emission standards for all non-road vehicles should be the same as those for road vehicles, EPD proposed to tighten the emission standards for newly approved non-road vehicles to bring the emission standards of newly registered non-road vehicles in line with that of newly registered road vehicles. Vehicle suppliers and operators were generally supportive of the proposal.

##### *Implementation timetable for the proposal*

The proposal adopts a different implementation timetable than that in relation to the emission standards for road vehicles. For example, private cars were required to comply with the Euro 6b OBD Euro 6-1 Standard by 1 July 2017 and the Euro 6c OBD Euro 6-2 Standard upon 1 September 2019; whereas off-road private vehicles are required to comply with the former standard by 1 January 2019 and the latter standard by 1 September 2019. A member expressed concern that the gap between the timetables would create a loophole for used road vehicles that are no longer road worthy to become non-road vehicles, which is exactly what the government policy aimed to prevent.

EPD explained that a different timetable was adopted for non-road vehicle because more time would be needed to allow for the availability of qualified vehicles, which meet the operating conditions under non-road applications, on the market. EPD believed that the gap between the different timetables will not create a loophole, as owners of relatively new Euro V vehicles, who had just paid the first registration tax, would have little incentive to convert them into off-road vehicles, and it was highly unlikely that aged vehicles would pass the emission test under the prescribed standards when applying for such conversion.

##### *Other regulatory measures for existing non-road vehicles*

Currently, the only mechanism to regulate non-road vehicles is to require newly registered vehicles to comply with the prevailing emission standards prior to their use, and a label would be granted by EPD to be affixed onto each vehicle.

A member suggested that monitoring should be conducted to detect excessive emissions due to the deterioration of non-road vehicles. EPD said that new Euro VI vehicles will be equipped with an on-board diagnostics system which can alert the operators of any abnormal performance. Failure to rectify the abnormal operation would render the vehicles inoperable, and that they have to be returned for repair.

A member enquired as to the feasibility of requiring annual check-ups for non-road vehicles. EPD said that the Transport Department would require road vehicles to undergo annual checkups, but, in view of the relatively low usage of non-road vehicles as compared with road vehicles, it would not be cost-efficient to do so.

A member suggested that a statutory service life can be imposed on non-road vehicles. EPD explained the difficulty to do this due to the varied uses of non-road vehicles. For a similar reason, it would not be feasible to introduce a unified emission standard for all non-road mobile machineries. Nevertheless, EPD would keep in view the latest technological advancements and experiences in other economies with a view to measuring emissions effectively.

#### *Other miscellaneous issues*

A member pointed out that the *Non-road Mobile Machinery Regulation* also regulates “regulated machines”, the number of which is much more than non-road vehicles; and he enquired about measures to further control emissions from these regulated machines. EPD noted that only very few compliant regulated machines were currently available in the market and EPD would keep an eye on the supply of compliant machines in the market and consult the trades on the feasibility of tightening the emission standards for such vehicles in due course.

In response to a member’s suggestion that the government should provide greater incentives for the use of electric vehicles (“EVs”) in the off-road application, EPD said that the airport would adopt EVs in its operations as far as possible and EPD would monitor the latest development and supply of EVs in the market.

### **Summary of the 231<sup>st</sup> Meeting of the ACE held on 5 March 2018**

#### **Proposals to update the Indoor Air Quality Objectives for offices and public places**

##### *Background*

The Environmental Protection Department (“EPD”) has been implementing since 2003 *the Indoor Air Quality Certification Scheme for Offices and Public Places* (“the Scheme”) with a view to encouraging property owners and management who install mechanical ventilation and air conditioning (“MVAC”) systems to adopt good Indoor Air Quality (“IAQ”) management practices in line with the World Health Organisation (“WHO”). Property owners and management may participate in the Scheme on a voluntary basis.

Room Temperature
Relative Humidity
Air Movement
Carbon Dioxide (CO <sub>2</sub> )
Carbon Monoxide (CO)
Respirable Suspended Particulates (PM <sub>10</sub> )
Nitrogen Dioxide (NO <sub>2</sub> )
Ozone (O <sub>3</sub> )
Formaldehyde (HCHO)
Total Volatile Organic Compounds (TVOC)
Radon (Rn)
Airborne bacteria

A set of IAQ objectives comprising 12 parameters (as shown in the above table) has been established for assessing the IAQ of premises. Premises owners or management who participate in the Scheme are required to commission accredited bodies to carry out an assessment. In the assessment, each of the 12 parameters is to be measured at an 8-hour interval and the data will be checked against the established objectives. The accredited body will then submit an assessment report and an IAQ certificate to the EPD for vetting and registration. The registered IAQ certificate can then be put up at prominent locations of certified premises for public information. Re-certification of all the 12 IAQ parameters is required at a five-year interval, while annual re-certification of 2 specific parameters, i.e. CO<sub>2</sub> and PM<sub>10</sub>, is required.

As the WHO published two new IAQ guidelines in 2009 and 2010 to establish two additional parameters on dampness and mould, and selected pollutants, EPD has decided that it is necessary to review the Scheme’s objectives against the latest WHO’s IAQ guidelines.

##### *The proposal*

EPD proposes the following updates to existing IAQ objectives:

The three existing physical parameters, i.e. room temperature, relative humidity and air movement, are proposed to be removed because they are only related to comfort of the occupants but not to health protection.

Two short-term objectives of NO<sub>2</sub> assessed at a 1-hour interval and HCHO assessed at a 30-minute interval are proposed to be added to address health effects due to short-term exposure to the two pollutants. EPD has studied suitable measurement protocols which revealed that portable analysers and standard testing methods for assessing these parameters are already available in the market.

A new IAQ parameter of mould is to be added to assess the existence of possible factors that facilitate the growth of mould. EPD has developed a prescriptive checklist for the accredited bodies to conduct walkthrough inspection for the purpose of mould assessment. This new parameter of mould was proposed to be included in the annual IAQ re-certification alongside with CO<sub>2</sub> and PM<sub>10</sub> given mould was commonly found in Hong Kong.

Regarding the compliance arrangement for TVOC, EPD proposes to replace the current VOC species with the five species set out in WHO’s new guidelines.

It is estimated that the cost for the full certification of all IAQ parameters under the proposed revision would increase by around 33% - 39%. EPD believes that this additional cost, which may amount to around an additional \$5,700, is relatively small spanning across the five-year full certification cycle. EPD proposes to launch the revised IAQ objectives on 1 July 2019 and would allow a premise which has conducted full certification of all IAQ objectives before 1 July 2019 to continue adopting the old set of objectives until its next full certification is required.

##### *Revision of existing IAQ objectives*

Regarding the proposed replacement of VOC species for the compliance of TVOC, a member commented that the newly proposed VOC species should be an addition rather than a replacement. EPD explained that WHO had not yet published any guideline related to VOC species when the Scheme was first launched in 2003, and EPD simply created the existing standard by referring to the relevant standards in some overseas jurisdictions. Replacement would be more appropriate as some of the existing VOC species were normally found in industrial workplaces only but not indoor public places and offices, where the newly proposed VOC species address.

A number of members showed concern for the removal of the three physical parameters. Firstly, a few members pointed out that these physical parameters might be related to the growth of mould and thus should be retained under the IAQ objectives. EPD explained that it recognised that the control of humidity was essential to minimising the growth of mould and thus the prescriptive checklist for mould assessment had stipulated the control of relative humidity as a

requirement. Secondly, members commented that human comfort should also be considered for the achievement of good IAQ and advised that EPD would draw up guidelines to address occupants' comfort in the premises.

#### *Scope of Application of the IAQ Objectives*

Two members enquired whether the Scheme would be extended to include residential premises. EPD explained that the Scheme targets offices and public places installed with an MVAC system which can effectively control fresh air intake and ventilation. Since residential buildings normally rely on natural ventilation or exhaust fans which are not as effective as MVAC systems, the Scheme might not be suitable for such buildings.

Nevertheless, members suggested that greater emphasis should be placed on premises where people have to stay for long hours on a daily basis, such as offices, universities and schools.

#### *Provision of incentives*

Noting that growth in the number of certified premises is rather slow, the Chairman enquired if there is any incentive to encourage more premises to participate in the Scheme. EPD said that some organisations had shared their experiences that participation in the Scheme could enhance their corporate image.

Members suggested that EPD should strengthen promotional efforts and provide more incentives, e.g. by granting funds on a matching basis under the Environmental Conservation Fund, to promote a higher participation rate. EPD should also make reference to overseas experience and consider making available to the public the environmental record of the properties.

Given the difficulties in obtaining a full certification of all IAQ objectives for some premises owners and management, a member considered that it would be more practical to provide technical assistance as well as funding support for them.

## CLIMATE CHANGE

### **Peru's glacial lake is a deadly flood time-bomb**

Global warming has turned Peru's Lake Palcacocha into a deadly threat to tens of thousands people living below it.

Lake Palcacocha is situated on a mountain beneath white peaks of glaciers. Below the mountain lies the city of Huaraz, with a population of more than 150,000.

In 1941, a chunk of ice broke away from the glacier in an earthquake, tumbling into the lake. The impact caused a flood wave which sent an avalanche of mud and boulders cascading down the mountain, killing about 1,800 people.

Today, the lake is potentially even more dangerous as the water-level of the lake rises according to the temperature. A temperature rise of 0.5 - 0.8 °C between the 1970s and the 2000s has seen a third of Peru's ice caps vanish into the lake in the last four decades.

Flood wave modelling by the University of Texas shows that a breakaway chunk of glacier could displace up to 15 billion litres of meltwater from the lake, propelling a wave up to 30 metres high over a ridge of rocks and down the mountain. A social anthropologist from Manchester University says that there are approximately 50,000 people living in the danger zone, and even if the people are warned, there could still be about 20,000 fatalities according to authorities' estimates, as no flood mitigation infrastructure is in place.

Ironically, for the poor, largely indigenous farmers in the verdant mountains around the ice caps, the problem is not too much water but too little. Because of the climate change the glaciers are gradually melting, leading to a water crisis and throwing the farmers' existence into jeopardy. As well, the warming means that new pests are creeping to higher altitudes, posing a threat to agricultural production.

[*The Guardian*, 29/06/2018]

### **Arctic reindeer herders tangle with new industries**

Climate change and technology enable mineral and energy extraction, shipping and tourism in the Arctic, while reindeer herders around the area express concern that they now face the on-ground consequences of climate change, namely mining operations, oil spills and poaching, as well as thoughtless behavior from townspeople and tourists. The traditional ways of life in the Arctic are under threats and tensions among its four million inhabitants are high.

Local officials approved a major copper project back in 2012 as it would bring in much-needed jobs and funds. Whilst mining companies believed that the mine can be run alongside reindeer herding and fishing, the project met fierce opposition from indigenous Sami herders and fishermen, who said that the plan to dump the mine's tailings in the fjord would destroy spawning grounds for cod and the mine would damage summer pasture grounds and frighten the reindeer.

Average temperatures in the Arctic region have risen more than 2 °C since pre-industrial times, twice as fast as the world average, according to research by the Arctic Council. Temperatures now sometimes spike above freezing in mid-winter, melting snow that then re-freezes into a blanket of ice on lichen pastures that the reindeer cannot nuzzle through. In the worst recorded 'rain on snow' event, about 61,000 of 275,000 reindeer died.

It is not only herders and energy companies that are facing off. Conflicts of interest between those continuing millennia-old traditions and other residents and visitors are increasing. Some herders complain that they have been suffering from poaching since a new highway opened to cars in November 2017.

[*Reuters*, 09/07/2018]

### **Oil majors win dismissal of New York City climate lawsuit**

The lawsuit commenced in early 2018 by New York City against five major companies for their contribution to global warming was eventually dismissed by a U.S. District Judge.

The city claimed that the companies knew for years that carbon emissions caused global warming yet continued to promote fossil fuels while pushing public relations efforts to discredit science on the risks of climate change. As a result, the city had to spend billions of dollars to mitigate the hazards of global warming. The city sought money damages against these companies.



The Court agreed with the argument that only the Environmental Protection Agency, but not the city, has standing under the federal Clean Air Act to bring lawsuits over pollution. Further, the Court said that global warming is an issue for the executive branch and the parliament and it concerns countless foreign governments and their laws and policies, such that the judiciary is not the venue to decide on the matter.

The companies welcomed the decision. Yet, the city planned to appeal the decision. The mayor said that big polluters must be held accountable for their contributions to climate change and the damage it will cause the city.

[Reuters, 20/07/2018]

### U.S. loses bid to end children's climate change lawsuit

The government's application to dismiss a lawsuit brought by a group of young environmentalists was rejected for the second time.

Twenty-one children and young adults, ages 11 to 22, accused the government and oil companies of violating their due process rights by knowing for decades that carbon pollution poisons the environment, but doing nothing about it.

The government contended that the proceedings were tantamount to an unconstitutional interference with the executive branch and would require improper decision-making by forcing officials to answer questions about climate change.

The federal appeals court, by a unanimous decision, held that the case needs to go to trial with a full factual record on the young plaintiffs' harms, their constitutional rights and climate science, and the government fell short of the "high bar" needed to dismiss the proceedings.

A trial is scheduled for 29 October 2018 in the federal court in Eugene, Oregon.

[Reuters, 21/07/2018]

### Heat records indicate man-made warming

Heatwaves are setting all-time temperature records across the globe, again.

Last week, Europe suffered its deadliest wildfire in more than a century in Greece, and one of nearly 90 large fires in the US West killed six people and destroyed hundreds of buildings in Redding, California.

Japan hit 41.1 degrees Celsius last Monday, its hottest recorded temperature ever. Records fell in parts of Massachusetts, Maine, Wyoming, Colorado, Oregon, New Mexico and Texas. And then there's crazy heat in Europe, where normally chilled Norway, Sweden and Finland all saw temperatures they have never seen before on any recorded date, pushing past 32 degrees. So far this month, at least 118 of these all-time heat records have been set or tied across the globe, according to the National Oceanic and Atmospheric Administration.

"We now have very strong evidence that global warming has already put a thumb on the scales, upping the odds of extremes like severe heat and heavy rainfall," Stanford University climate scientist Noah Diffenbaugh said. "We find that global warming has increased the odds of record-setting hot events over more than 80 per cent of the planet, and has increased the odds of record-setting wet events at around half of the planet."

Climate change is making the world warmer because of the build-up of heat-trapping gases from the burning of fossil fuels and other human activities.

And experts say the jet stream – which dictates weather in the Northern Hemisphere – is again behaving strangely. That allowed the heat to stay in place over three areas where the kinks are: Europe, Japan and the western United States.

The same jet stream pattern caused: the 2003 European heatwave; the 2010 Russian heatwave and fires; the 2011 Texas and Oklahoma drought; and the 2016 Canadian wildfires, Pennsylvania State University climate scientist Michael Mann said, pointing to past studies by him and others.

He said that these extremes were "becoming more common because of human-caused climate change and in particular, the amplified warming in the Arctic".

A study by European scientists concluded European heatwaves are now twice as likely to occur, because of human-caused global warming.

[SCMP, 30/7/2018]

### Trump's new environmental policy

Donald Trump has proposed a new environmental policy in early August that seeks to replace the "Clean Power Plan" implemented in the Obama era. Critics argue that the new plan would do even more damage than simply repealing the "Clean Power Plan".

Obama's Clean Power Plan aimed to cut emissions from U.S. energy production 32% below the levels in 2005 by 2030. It did so by encouraging broad changes such as shutting down coal plants that are responsible for 67% of power sector emissions, using more cleaner-burning natural gas and boosting renewable electricity. Obama's plan also sparked legal challenges as to whether the Environmental Protection Agency ("EPA") has the power to implement changes on the whole power market on the national level, as it is only authorised to minimise emissions from individual power plants under the *Clean Air Act*. The U.S. Supreme Court put the plan on hold in February 2016.

Trump's proposed replacement comes into play in three major aspects: (1) it allows individual states to decide how to curb carbon dioxide emissions from coal plants, (2) it relaxes the prescribed emissions standards set out by the Clean Power Plan, and (3) it encourages coal plants to boost efficiency gains.

#### *Flexibility in state's standards to control emissions*

There is no mention of an overarching national goal for reductions in Trump's proposal. Instead, the new rule sets guidelines for states to develop and submit to the EPA plans to establish "patterns of performance" for existing coal plants.

The absence of national standards would be tantamount to a "race to the bottom". Some suggest that the requirements under the Clean Power Plan have appeared more modest in hindsight, as the U.S. is on track to reduce carbon dioxide emissions due to a market trend away from coal to natural gas and renewable energy anyway. But others argue that the plan at least offered a guarantee that those emissions reductions would be preserved, while creating a long-term framework for achieving further progress. To remove the national emissions standard could mean "lost momentum in an urgent crusade against climate change", according to environmentalists.



### *Relaxing the emissions standards*

According to the EPA, transportation and electricity generation are the biggest sources of heat-trapping gas emissions in the U.S., accounting for 56 % of the total in 2016. Due to cheap natural gas and the falling cost of wind and solar power, carbon dioxide emissions from the U.S. electricity sector are on pace to fall below the targets envisioned in Obama's Clean Power Plan. Transportation generation now accounts for one-third of U.S.'s carbon dioxide emissions and has been steadily rising over the past few years

In any event, federal fuel-economy standards are regarded as a vital tool for curbing gasoline use. But, assuming Trump's proposal is finalised, it is foreseen, in an analysis by research firm Rhodium Group, that U.S.'s cars and trucks would emit an extra 321 million to 931 million metric tons of carbon dioxide into the atmosphere between now and 2035 as a result of the weaker rules. The same analysis found that the extra pollution in 2035 alone would be more than the current annual emissions from countries like Austria, Bangladesh or Greece. While Trump's administration claims that the new measures would have negligible contribution to global warming, in that the concentrations of carbon dioxide in the atmosphere would only be no more than 0.16% higher under the relaxation than they would be if the stricter Obama-era rules had stayed in place, author of the Rhodium Group report argues that the relaxation can have a bigger effect on emissions than expected, as any climate policy should not be viewed in isolation. It requires a wide variety of efforts to cut emissions from every sector of nearly every country in order to stop global warming.

### *Encouraging coal plants to boost efficiency gains*

Obama's Clean Power Plan requires many coal facilities to install modern pollution control technology when they do major upgrades, which practically discourages coal companies from upgrading their facilities because of the high cost. As a result, 40% of the nation's coal plants had closed, as a president of a trade group that represents coal producers noted.

Trump's proposal would allow old, high-emitting coal plants to make upgrades without installing pollution control equipment. These upgrades would encourage coal plants to make heat-rate improvements (or efficiency gains) that translate into fewer carbon dioxide emissions per unit of generated electricity. These changes, such as adding automation or replacing worn turbine seals, would yield at most a 6% gain in efficiency, along with a corresponding fall in greenhouse gas emissions.

The new proposal was generally welcomed by the coal manufacturing community.

Analysts and environmental activists believe that Trump's proposal would allow coal plants to produce cheaper electricity than sourced from natural gas, and could even displace the cleaner sources of energy. Emissions might rise because of the higher efficiency and the lower operating cost of coal. On the other hand, the upgrades would also mean an extension of useful lives of the coal plants which would also contribute to the increase in carbon emissions. Ironically, by the EPA's own analysis, replacing Obama's plan with Trump's would result in as many as 1,400 additional premature deaths annually by the year 2030, as well as up to 120,000 new cases of exacerbated asthma.

[*The New York Times: How Big a Deal Is Trump's Fuel Economy Rollback? For the Climate, Maybe the Biggest Yet*, 03/08/2018; *The New York Times: Trump's Plan for Coal Emissions: Let Coal States Regulate Them*, 17/08/2018; *Time: President Trump's Power Plant Plan May Increase U.S. Carbon Pollution*, 18/08/2018; *The New Republic: Trump's Climate Plan Could Do More Damage Than No Plan At All*, 23/08/2018]

### **Asia gets hotter**

As temperature rises because of climate change, heatwaves will become more frequent and more lethal, said the Chief Experimental Officer of the Hong Kong Observatory.

The World Health Organisation estimates that by the 2030s, heat-related deaths may rise by more than 21,000 across Asia. On a global scale, rising temperatures are expected to cause approximately 250,000 additional deaths per year between 2030 and 2060, through heat exposure, tropical disease and other illnesses.

Apart from heatwaves, temperature rise may also cause other fatal events, such as floods and landslides triggered by torrential rains, tropical cyclones and plagues. A study released by Oxford University determined that climate change "doubled the likelihood" of such events.

According to a study by the World Bank, without a cut in carbon emissions more than half of South Asia will become "hotspots" which would result in a decline in living standards by 2050; and even if carbon emissions are reduced, up to 375 million people in these areas would still see their living standards drop.

Further, according to another study by the Massachusetts Institute of Technology, global warming might turn the North Plain region of China, which spans five provinces, into an unlivable region, affecting approximately 400 million residents. The report noted that by the end of the century, the region would face heatwaves so severe that they could kill even healthy people within hours.

[SCMP, 11/08/2018]

### **Rain in Kerala**

In August 2018, once-a-century rain pounded the Indian State of Kerala and displaced 1.3 million people as a result of devastating floods. The monsoon rains on which farmers in the southern state depend for their food and livelihoods dumped two-and-a-half times the normal amount of water across the state last week

While it is hard to attribute any single extreme weather event to climate change and to distinguish from climate change events from what scientists call "natural variability", recent research does show a three-fold increase in widespread extreme rains in Asia during 1950-2017, leading to large-scale flooding. Across India, flooding caused by heavy monsoons rainfall claimed 69,000 lives and left 17 million people without homes during this period. Kira Vinke, a German scientist, stated that these floods in Kerala are basically in line with climate projections and warned that if we continue with current levels of emissions, we will have unmanageable risks.

Intensification of monsoon rainfalls in central and southern India was believed to be caused by the overheating of landmass due to climate change. The changes observed so far have occurred after an increase in Earth's average surface temperature of only 1 °C above pre-industrial levels. However, according to a World Bank report entitled "*South Asia's Hotspots*", India's average annual temperatures are set to rise from 1.5 °C to 3 °C compared to that benchmark by mid-century on current trends.

The same report warned that "[i]f no corrective measures are taken, changing rainfall patterns and rising temperatures will cost India 2.8 percent of its GDP and will drag down living standards of half its population by 2050".

Flooding is not the only looming problem; a recent research has projected that if manmade carbon emissions continue unabated, some regions in northeast India could literally become unlivable by the end of the century due to a deadly combination of heat and humidity during heatwaves.

[*NDTV*, 25/08/2018]

### Vietnam losing coastline

Sea level rise from climate change threatens to inundate Vietnam, while new coal-fired power plants and ill-advised coastal development also jeopardize fragile coastlines.

ELAW Staff Scientist Dr. Heidi Weiskel recently returned from Hanoi, Hue, and Ho Chi Minh City, where she collaborated with ELAW partners at the Law and Policy of Sustainable Development Research Center (**LPSD**) to protect coastal ecosystems. She also taught at the Climate Change Summer School, hosted by the Berlin-based Independent Institute for Environmental Issues and the Mien Trung Institute for Scientific Research. Heidi reports:

“On a field trip with my students from the Climate Change Summer School, we learned that in the last 30+ years, the waters off the coast in central Vietnam have come inland a full kilometer. Standing on a levee looking out at the seemingly tranquil East Vietnam Sea, it was hard to imagine. But waves are eroding beaches too quickly for communities to do anything but evacuate. The government has been assisting in relocating people, but it has been terrible for communities that must break local ties, upend their lives, and find new ways to make a living in completely unfamiliar surroundings.

We met with Đặng Văn Tuỳ, President of the Phu Thuan commune People’s Committee near Hue. He explained to us that in his community of 10,000 residents, 210 households have already been relocated (see photo), and the sea will not stop coming.

I was inspired by both the staff at LPSD and the participants in the Summer School. Coal-fired power plants are an enormous threat to the global climate. LPSD is working with communities threatened by new coal-fired power plants. LPSD wants to ensure that communities have the scientific information they need to understand the true impacts of coal-generated power and advance efforts to promote clean, green energy.

The participants in the Summer School were equally inspiring. They came from all over Vietnam – some from vulnerable island communities, others from universities and NGOs. They arrived knowing quite a bit about the impacts of climate change, and they asked good, hard questions during the session I co-led on coastal climate change with Pham Van Tan, Deputy Director of the Department of Climate Change within the Ministry of Natural Resources and the Environment.”

[*ELAW Press Release*, 01/09/2018]

### Meeting to plan climate-action

“In September thousands of companies, scientists, activists and government officials will meet in California to participate in the Global Climate Action Summit. Initiated by California governor Jerry Brown, it aims to “to prevent dangerous climate change”. But the truth is that climate change is already here, and the world is still scrambling to find long-term solutions.

Since US President Donald Trump’s administration remains detached from the reality and urgency of climate change, China and California are increasingly seen as the planet’s best hope to lead and deliver solutions.

But are they? Both have indeed made strides towards addressing climate issues. China is phasing out domestic coal use and is the world’s leading manufacturer of solar panels. California requires that 33 per cent of the state’s retail electricity be generated by renewable sources by 2020. As the world’s second-and-fifth-largest economies, China and California do have the potential to be climate leaders.

However, their biggest barrier may be their continued support of the fossil fuel industry, which casts a long, dark shadow over these developments and calls into question the integrity of China and California’s environmental commitments.

For instance, China has successfully reduced its domestic coal consumption, but this shift has in turn propelled the ailing Chinese coal industry to aggressively expand overseas and put other countries on a coal-heavy development path. Chinese companies are building six new coal plants in Vietnam; and in Bangladesh, Chinese developers and financiers are involved in the construction of 11 new coal plants.

Meanwhile, China’s increasing reliance on liquefied natural gas is undermining its environmental credibility. In July, for example, the first shipment of LNG from the Arctic arrived in China via the Northern Sea Route. The LNG was produced by the Yamal LNG project, located about 500 km south of a protected wetland under the Ramsar Convention. As more ships travel through the Northern Sea Route, the risk of shipping accidents, oil spills and noise pollution in the fragile Arctic region dramatically increases.

Like China, California also has a fossil fuel addiction it just can’t kick. This year, California announced it had reduced emissions to 1990 levels, but these calculations don’t include the Aliso Canyon methane leak. In 2015 and 2016, the leak spewed the equivalent of 2.49 million tonnes of carbon dioxide into the air, wiping out much of the state’s carbon reductions.

Despite the known dangers of natural gas (fracking, methane emissions, health effects), California has also issued more than 20,000 new drilling permits inside California, which adds to the state’s 84,000 existing oil and gas wells. These wells threaten the public health and safety of about 5.4 million people who live within a mile of them.

Both China and California are increasing their reliance on oil imports from sensitive ecosystems. In the Amazon, often called the “lungs of our planet”, China is a leading investor in oil extraction, buying up pristine rainforests for fossil fuel development.

California is an awkward partner in this arrangement. According to Amazon Watch, while China bankrolls much of the investment, California is the world’s leading refiner and consumer of Amazon crude. About half of the oil exports from the Western Amazon Basin come to California to be processed by refineries and used by consumers in the state.

China and California have taken positive first steps towards promoting renewable energy, and it is widely understood that the world cannot fully de-carbonise overnight. But real climate leaders can’t tout renewables while failing to keep fossil fuels in the ground. China and California need to establish firm timelines for phasing out all fossil fuels, both inside and outside their borders.”

[*SCMP* (Letter to the editor from Michelle Chan, vice-president of programmes for Friends of the Earth (abridged)), 08/09/2018]

## Hurricane Florence's rains may be 50% worse

According to recent research by Lawrence Berkeley National Laboratory, the rainfall expected to accompany Hurricane Florence is expected to be more than 50% higher, and the hurricane's size is predicted to be about 80 km wider, than it would have been without global warming.

Hurricane Florence, expected to push a surge as high as 13 feet onto the shore when it makes landfall, is described as one of the worst hurricanes to hit the coastal Carolinas since Hurricane Hugo in 1989.

The research appears to be a landmark as it is the first time scientists are able to make such a forecast before a storm. Michael Wehner from the Laboratory explained that climate change increases the amount of water in the atmosphere that precipitate in a hurricane; it also changes the structure of the storm to make it more efficient at precipitation. In the past, scientists have long been reluctant to attach a single extreme weather event to climate change. However, as science marches on, Wehner believed that they now have the ability to do it.

[*National Geographic*, 13/09/2018]

## REGIONAL & INTERNATIONAL

### CHINA

#### Trees thrive in Beijing's smog

Trees in Beijing grow more quickly in smog than they do under blue skies, mainland researchers have found.

The government-backed study, published last month in the journal *Global Change Biology*, tracked the growth rates of six aspen trees in Beijing between 2012 and 2015, when the city was shrouded in some of the thickest smog it has ever seen. Field observations showed that the thicker the smog, the faster and stronger the trees would grow. This suggests an even more challenging task in coping with climate change while fighting air pollution in the future, said Liu Lingli, the study's lead researcher from the Institute of Botany at the Chinese Academy of Sciences in Beijing. "This is because trees that absorb the major greenhouse gas carbon dioxide will grow more slowly than they did once the aerosol concentration decreases."

In effect, if the drive to eradicate atmospheric pollution proves successful, more trees would have to be planted to help absorb the greenhouse gases that cause global warming.

Liu said countries with high levels of PM2.5 – the small particles that are most harmful to human health – such as China, India and Brazil, should reduce their carbon footprints by a larger percentage in the future to compensate for the loss of this "positive side effect" of air pollution.

Aerosols are minuscule particles floating in the atmosphere, including soot, dust and sulphates. They can be produced from industrial and agricultural processes such as burning coal, gas or wood. Such particles are harmful to human health but help plants to photosynthesise, the process whereby they convert light into energy. Aerosol particles can increase the efficiency of photosynthesis by diffusing light, as observations over the past 30 years have showed.

A study funded by Nasa in 2004 found that tiny atmospheric particles help to scatter sunlight, allowing it to reach more leaves in different layers of each plant.

[*SCMP*, 19/07/2018]

#### Customs intercepts smuggled trash

China's customs authority intercepted nearly one million tonnes of illegally imported rubbish in the first half of this year, part of a track-down on smuggled waste.

The General Administration of Customs (GAC) has made the campaign against smuggled foreign waste one of its priorities for this year following Beijing's imposition of bans on 24 types of recyclable material, including plastics.

The GAC said in a notice that it uncovered 276 cases of waste smuggling in the first half of the year, up 89 per cent year on year, involving 987,900 tonnes of rubbish. In an operation it has called Sword at the Country's Gate 2018, the Authority has focused on foreign rubbish, the trade in endangered species and tax evasion by commodity importers. It said it tackled 963 smuggling cases overall in the first six months, with a value of 20.3 billion yuan (HK\$23.8 billion).

The GAC also said on Tuesday that it had intercepted a "Russian-style" truck in the northern city of Harbin containing the body parts of endangered species worth 106 million yuan, the largest haul of its kind in years.

[*SCMP*, 19/07/2018]

#### Shandong limits steel and coal production

Shandong's Environmental Protection Bureau has announced a 3 year action plan to cut steel and coal production capacity, close down outdated aluminium smelters and convert to cleaner energy as part of a countrywide anti-pollution programme.

The Bureau said that pig iron and crude steel production capacity will be reduced by 600,000 and 3.5 million tonnes respectively by the end of 2018. Over 70 percent of heating provided to rural areas in winter could come from clean energy sources by 2020. An increase in natural gas imports from other provinces would also occur implemented to reach a target of energy from natural gas sources of approximately 8 percent by 2020. The plan also targets reduction in the use of fertilisers by 6 percent and pesticides by 10 percent by 2020, in comparison to 2015 levels.

In the fifth year of a "war on pollution", China has been working on its way to reverse the damage to the country's environment since the economy opened up in 1978. President Xi Jinping promised the Chinese Communist Party will endeavour to meet the country's improved environment goals.

[*Reuters*, 04/08/2018]

## China's plan to clean up rural land and water

China's countryside has long been struggling to deal with land and water pollution caused by unsustainable farming practices, poorly regulated, privately-owned mines and manufacturing plants and a huge increase in plastic waste. A lack of infrastructure in rural areas to dispose of human waste and sewage, together with the huge amount of livestock waste, chemical fertilisers, pesticides and rubbish have become a serious issue the government needs to tackle. Rehabilitating contaminated land has also become an urgent matter for the government.

A new plan was approved "in principle" by the Ministry of Ecology and Environment on 23rd July 2018 to reduce the use of fertiliser and pesticide and to promote recycling throughout the countryside. It focuses on restoring wetlands, planting trees and eliminating "disorderly" rural construction to improve the appearance of China's villages as well as improving garbage and sewage treatment.

[SCMP, 24/07/2018]

## JAPAN

### Japan kills 177 whales

A fleet of Japanese whaling ships had caught 177 minke and sei whales during a three-month tour of the northwestern Pacific, the government yesterday said.

The three-ship mission returned home as Tokyo prepares to make its case to resume commercial whaling at a meeting of the International Whaling Commission (WC) in Brazil next month.

During the latest 98-day mission, the ships caught 43 minke whales and 134 sei whales, the Fisheries Agency said.

Foreign pressure on Japan to stop whaling has only made conservatives and politicians more resolute about continuing their push to resume commercial whaling.

The latest mission was part of a 12-year project to study the number, eating patterns, and biology of whales that Japan wants to analyse to support its claim that certain whales are not endangered and could be caught for consumption. Japan is a signatory to the moratorium on whale hunting, but exploits a loophole which allows whales to be killed in the name of scientific research.

It makes no secret of the fact that meat from the expeditions ends up on dinner tables, despite a significant decline in the popularity of whale meat.

[SCMP, 23/08/2018]

## BOTSWANA

### Mass slaughter of elephants

Ninety elephant carcasses have been discovered in Botswana, with their tusks hacked off, in what is believed to be one of Africa's worst mass poaching sprees. Most of the animals killed were large bulls carrying heavy tusks, according to *Elephants Without Borders (EWB)*.

The grim discovery was made over several weeks during an aerial survey by the group and the Department of Wildlife and National Parks of Botswana.

"We started flying the survey on 10 July, and we have counted 90 elephant carcasses since the survey commenced," said Mike Chase, the director of EWB. "Each day we are counting dead elephants."

The animals were shot with heavy calibre rifles at watering spots near a popular wildlife sanctuary located in the Okavango Delta, which is a Unesco World Heritage List. Unesco stands for United Nations Educational, Scientific and Cultural Organisation.

"The scale of elephant poaching is by far the largest I have seen or read about in Africa to date," Chase said.

Botswana has the largest elephant population in Africa at over 135,000.

The population of African elephants has fallen by 111,000 to 415,000 in the past decade, according to the International Union for Conservation of Nature. The killing continues on an obscene scale of approximately 30,000 elephants per annum to meet demand for ivory in Asia, where tusks sell for around US\$1,000 a kilogram.

Chase said elephants in Zambia and Angola, north of Botswana, "have been poached to the verge of local extinction, and poachers have now turned to Botswana".

Botswana previously had a zero-tolerance approach, with a "shoot-to-kill" policy against poachers, who have also targeted rhinos in recent months.

[SCMP, 05/09/2018]

## GREECE

### New geothermal law

A draft law entitled *Research, exploitation and management of the geothermal potential of the country and other provisions* has been proposed by the Ministry of Environment and Energy in Greece. The draft is now open for public electronic consultation and all citizens are welcomed to submit their own proposals. These views and proposals could play an essential role in improving the draft.

By the end of July 2018, most of the comments from the public concerned the proposals for regulating future geothermal development.

[ThinkGeoEnergy, 30/07/2018]

## ENGLAND

### UK churches convert to renewable energy

Thousands of English Churches, including York Minster, have agreed to switch to renewable power to help combat climate change.

The Church of England claimed that thousands of Christian and non-Anglican places of worship are now using 100% renewable electricity instead of fossil fuels. Fifteen Anglican cathedrals, including Liverpool, Coventry and York Minster, are among churches which have signed up to green electricity tariffs. Most of the other churches have joined the move through the Big Church Switch campaign run by the Christian charities, Christian Aid, Tearfund and the Church of England's environment programme.

Churches have been annually spending an average of approximately £1,000 on electricity. It is estimated that British churches have now diverted more than £5m to clean energy providers. According to Christian Aid, the renewable energy tariff was often a cheaper choice than the fossil fuel-dominated one.

Nicholas Holtam, the bishop of Salisbury and the Church of England's lead bishop on the environment, claimed that they were trying to join together to make a real difference on Climate change.

[*The Guardian*, 03/08/2018]

## FRANCE

### Rooks to be cleaners

A French historical theme park, the Puy du Fou Parque in the western Vendee region, has recently trained six rooks to pick up cigarette ends and rubbish. Their "service" is expected to commence within a week. Nicolas de Villiers of the park said the goal of this project is not just to "clear up" but mainly to give a message that "nature itself can teach us to take care of the environment".

Rooks are considered to be particularly intelligent. They like to communicate with human beings and establish a relationship through play. The small "cleaning team" has been trained to spruce up the park by using small boxes which delivered a small piece of bird food every time the rooks put in a cigarette end or small piece of rubbish.

Australian magpies also have the ability to understand the meaning of different calls and essentially search for the nearest predators, and so could also be trained as cleaners.

[*The Guardian*, 11/08/2018]

## IRELAND

### Sovereign fund gets rid of investments in fossil fuel

In accordance with a bill passed with all-party support in the lower house of parliament, the Republic of Ireland decided to sell off more than €300m worth of shares in fossil fuel companies "as soon as practicable". All investments in coal, oil, gas and peat will be sold by the state's €8bn national investment fund within 5 years. In comparison, Norway's huge \$1tn sovereign wealth fund is maintaining its oil and gas holdings. The Republic of Ireland will become the world's first country to make such a significant decision for the purpose of combating climate change.

Whilst supporters of the bill believe that burning of existing fossil fuel contributes to catastrophic climate change and that decisions to explore for and produce more fossil fuels are "morally wrong and economically risky", some critics argue that using influence as a shareholder to persuade fossil fuel companies to change can be more effective.

The divestment bill is expected to pass rapidly through the upper house and become law before the end of 2018. Gerry Liston at Global Legal Action Network, one of the drafters of the bill, claimed that a continuation of financially sustaining the fossil fuel industry does not push governments to meet their obligations under the Paris agreement. He urged the rest of the world to follow Ireland's lead.

[*The Guardian*, 12/07/2018]

## UNITED STATES

### Disney bans plastic straws

The Walt Disney Co. has announced its plan to stop using single-use plastic straws and plastic stirrers at all of its locations. The Disney officials claimed this plan will amount to "a reduction of more than 175 million straws and 13 million stirrers annually".

According to a recent news release from Disney, the policy is a part of Disney's "long-standing commitment to environmental stewardship." It will be in place by mid-2019. In addition, Disney also claimed to have further moves to minimise single-use plastics by transitioning to refillable in-room amenities in hotels and on cruise ships, reducing the number of plastic shopping bags available at resorts and on cruises and eliminating polystyrene cups.

[*CNN*, 01/08/2018]

## INDONESIA

### Children using goggles to save the reef

Indonesia's maritime affairs minister has generated a creative way to save precious reefs from marine pollution by offering free goggles to children in the archipelago's remote coastal regions.

According to Minister Susi Pudijastuti, the objective of the programme is to educate local children to protect their precious reefs by letting them understand the beauty of the underwater. She claimed that all they are doing is giving the children "the eyes" and then asking them to be "one of the guards of the oceans."

Beginning in 2016, the program has provided more than 2,000 pairs of goggles to children in West Papua, Maluku, Sulawesi and east and west Nusa Tenggara. As the world's second biggest marine polluter, which disposes 3.22m metric tons of waste annually, Indonesia is working out its own way to fight marine pollution.

[*The Guardian*, 04/08/2018]

## KENYA

### Plastic bags ban

Twenty-four nations in Africa have banned lightweight plastic bags, and Kenya has gone a step further by putting in place the world's strongest laws to enforce the ban.

Plastic bags, blown by wind or carried away by runoff, are Kenya's most visible plastic waste problem. In 2015 Kenya was using 24 million bags a month; the local "kidogo", micro economy was reliant on them for small purchases, such as a handful of washing powder. Aside from the visual pollution they cause, plastic bags clog up waterways and sewers, kill ocean marine life – such as turtles, seabirds, dolphins and whales – and are even leaching plastic directly into the food chain; cows in Nairobi abattoirs have been found to have up to 20 bags each in their stomachs.

On 20 August 2017, an official nationwide ban came into effect. Fines of up to 4 million Kenyan shillings (A\$52,800) or a four-year gaol term apply to anyone involved in the manufacture, importation or even the use of plastic bags.

Globally, a change in attitude towards plastic bags is in the wind. An ever-growing list of countries – 46 to date – have barred them.

Kenya's stringent penalties for those who flout the plastic-bag ban are mainly aimed at manufacturers and importers, but regular citizens using plastic bags are not exempt. Recently, trader was put on a good behaviour bond of US\$20,000 for trading in plastic bags.

Last February, 29 people faced fines of almost US\$500 each (the rough equivalent of a month's average wage in Kenya) or a one-year gaol term following a crackdown in the coastal city of Mombasa.

In Tharaka Nithi County, schoolgirl Hilda Gacheri Bundi became something of a viral sensation in Kenya when she was photographed using an improvised bag made from banana leaves. In Nairobi, Alfred Mureithi, a driver for a tourism company, says: "So far, so good – it's been successful. Many people were employed in that sector, so initially there was a lot of resistance, a hue and cry. But these plastic bags ... you'd find them on fences, on trees, in the national parks. Even cows were ingesting these things, and sometimes they would die from it, especially the calves."

Since the ban was introduced, instances of plastic appearing in the guts of slaughtered livestock has decreased from about 30 per cent to 10 per cent. "Everybody is happy to see the ban, although initially they weren't," says Mureithi. "It's a good thing, and people have just accepted it."

Perhaps the ban's most vocal opponent was the Kenya Association of Manufacturers (KAM). Kenya was a major exporter of plastic bags in Africa, and KAM's spokesman Samuel Matonda said it would cost 60,000 jobs and force 176 manufacturers to close. "It will even affect the women who sell vegetables in the market – how will their customers carry their shopping home?", he added.

KAM launched a legal bid to quash the ban, but its challenge was unsuccessful. Kenya's Environment and Lands Court ruled on 27 June that "the plastic ban is for the common good of the general public and, as such, is lawful".

With the bag ban bedded down for good, the Kenyan government is looking to tackle another environmental problem – plastic bottles.

The National Environment Management Authority (NEMA) had threatened to ban all plastic bottles from 30 April 2018, unless manufacturers took measures to implement recycling schemes. Whilst the ban never came to pass, it did have the effect of galvanising industry stakeholders to organise their own recycling collection points throughout Kenya. NEMA also announced a proposed ban on plastic straws.

Kenya is on-trend again in this regard: on 2 July 2018, Seattle became the first major US city to ban them.

[*Australian Financial Review*, 14-15/07/2018]

## INDIA

### Court orders asbestos clean up

Last week, India's National Green Tribunal (NGT) ordered quick remediation of 25,000 cubic meters of asbestos waste which sits in a towering pile in the village of Roro in the State of Jharkhand. The waste was left there 35 years ago by asbestos mining company Hindustan Industries Ltd.

This significant victory for the villagers against big-business follows work that began in 2012, when ELAW partner Shweta Narayan traveled to the site to collect soil samples that documented dangerous levels of asbestos exposure. Even small amounts of asbestos can cause severe health problems, including lung cancer.

The NGT ordered a committee of government officials to submit a plan by September 2018 to include placing a fiber mat, soil, and seeds of local plants on top of the asbestos dump, and to implement other measures so the dump no longer threatens the health of nearby tribal communities.

The company must pay the costs of remediation per the *Polluter Pays Principle*. Villagers suffering from symptoms of asbestos exposure can be compensated via a claim procedure specified in the order.

Dr. Mark Chernaik, an ELAW scientist, worked closely with Rahul Choudhary at the Legal Initiative for Forest and Environment, and other Indian advocates to prepare three reports that the NGT considered in making its order.

The NGT also ordered a clean up at asbestos mines in Rajasthan, Karnataka, and Andhra Pradesh. Mark also helped with the victory in Rajasthan,

[*ELAW Press Release*, 22/08/2018]



## WORLD

### Tackling global plastic waste

The world is responding to the scourge of single-use plastics: Seattle banned plastic straws as of 1 July 2018; Vanuatu announced plans to ban single-use plastics this year; Starbucks will phase out plastic straws worldwide by 2020; and Costa Rica proposes banning most single-use plastics by 2021.

In Honduras, ELAW partner Laura Palmese is working to ban straws and all single-use plastics on Roatán, a popular tourist island on the southern edge of the Mesoamerican Barrier Reef. “Although some restrictions are in place, they are weak and poorly enforced,” says Laura. “Plastic waste in Roatán is a serious, growing problem.”

Laura works as a legal advisor to the Bay Islands Technical Committee, the Bay Islands Tourism Bureau, and The Roatán Reef Guardians. She is an expert on waste management and legislation in Honduras and is a member of the drafting group on a new National Waste Management Law and Policy. Laura has worked with ELAW to organise several events and workshops in Roatán on waste management practices for teachers, students, and community leaders.

“It’s devastating to dive on coral reefs and see pieces of trash floating past,” says ELAW Staff Scientist Dr. Heidi Weiskei. “And now we are discovering that many of the fish species we consume are filled with microplastics.”

ELAW partners across the world are stepping up to challenge single-use plastics. In Guatemala, Alianza de Derecho Ambiental y Agua is working with municipalities in the ocean-flowing Motagua River watershed to develop new regulations to reduce waste, including a ban on the most persistent plastics.

In Canada, Calvin Sandborn, legal director of the University of Victoria Environmental Law Centre, joined Margaret Atwood (author of *Handmaid’s Tale*) to urge Canada to establish a national strategy to reinvent the plastic economy.

In Uganda, Greenwatch championed the case for a total ban on the use, import, and manufacture of micro-thin plastic bags, called “kaveera”. The High Court in Kampala pronounced that kaveera deprive Ugandans of their constitutional right to a clean and healthy environment, and the government should work to ban them.

[ELAW Press Release, 18/07/2018]

### We have consumed an entire year ‘s resources!

Humanity is devouring our planet’s resources in increasingly destructive volumes, according to a new study that reveals that this year we have consumed a year’s worth of carbon, food, water, fibre, land and timber in a record 212 days.

As a result, the *Earth Overshoot Day* – which marks the point at which consumption exceeds the capacity of nature to regenerate – has moved forward two days to 1 August, the earliest date yet recorded.

To maintain our current appetite for resources, we would need the equivalent of 1.7 Earths, according to *Global Footprint Network (GFN)*, an international research organisation that makes an annual assessment of how far humankind is falling into ecological debt.

The consumption overshoot began in the 1970s, when rising populations and increasing average demands pushed consumption beyond a sustainable level. Since then, the day at which humanity has exceeded its annual planetary budget has moved forward.

Thirty years ago, the overshoot date was 15 October; twenty years ago, 30 September; ten years ago, 15 August. There was then a brief slowdown, but the pace of over-consumption has picked up again in the past two years. On current trends, next year could mark the first time, the planet’s resources budget is busted in July.

Whilst ever greater food production, mineral extraction, forest clearance and fossil-fuel burning bring short-term (and unequally distributed) lifestyle gains, the long-term consequences are increasingly apparent in terms of soil erosion, water shortages and climate disruption.

The day of reckoning is moving nearer, according to GFN: “Our current economies are running a Ponzi scheme with our planet,” he said. “We are borrowing the Earth’s future resources to operate our economies in the present. Like any Ponzi scheme, this works for some time. But as nations, companies, or households dig themselves deeper and deeper into debt, they eventually fall apart.”

However, the situation is reversible. Research by GFN indicates political action is far more effective than individual choices. GFN notes, for example, that replacing half of meat consumption with a vegetarian diet would push back the overshoot date by five days. Efficiency improvements in building and industry could make a difference of three weeks, and a 50 per cent reduction of the carbon component of the footprint would give an extra three months of breathing space.

In the past, economic slowdowns – which tend to reduce energy consumption – have also shifted the ecological budget in a positive direction. The 2007-08 financial crisis saw the date extended by five days. Recessions in the 90s and 80s also lifted some of the pressure, as did the oil shock of the mid 1970s.

But the overall trend is of the costs of global over-consumption increasingly being paid by planetary support systems.

[*The Guardian*, 24/07/2018]

### Food waste is increasing

Food waste could rise by almost a third by 2030 when more than 2 billion tonnes will be binned, researchers have said, warning of a “staggering” crisis propelled by a booming world population and changing habits in developing nations.

The United Nations has set a target of halving food loss and waste by 2030. But the Boston Consulting Group study found that if current trends continued, it would rise to 2.1 billion tonnes annually – an amount worth US\$1.5 trillion.

About a third of the world’s food is lost or thrown away each year.

Currently, we waste 1.6 billion tonnes of food annually, worth some US\$1.2 trillion dollars.

Much of the projected increase was down to a swelling world population, with more people resulting in more waste.

Household waste would increase in developing countries as consumers gained more disposable income, said the report, which identified five key changes that it said could save nearly US\$700 billion in lost food.

They include more awareness among consumers, stronger regulations and better supply-chain efficiency and collaboration along the food production chain.

Liz Goodwin of the World Resources Institute, said she believed measures to cut wastage were having an effect, and that the world would at least be on the way to meeting the 50 per cent reduction target by 2030.

Consumers, businesses and regulators would all have to play a role in driving change, Goodwin added.

“We need a shift in our attitudes to food waste – I think we need to get to the point where it just isn’t acceptable to throw food in the bin,” she said.

[SCMP, 23/08/2018]

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**Convictions under environmental legislation: June to September 2018 (October 2018 data not available)**

**[Note: the EPD no longer classifies second (and subsequent) offences.]**

The EPD's summary of convictions recorded and fines imposed during the above period is as follows:

***June 2018***

Fifty-seven convictions were recorded in June 2018 for breaches of legislation enforced by the Environmental Protection Department.

Eleven of the convictions were under the Air Pollution Control Ordinance, 20 were under the Noise Control Ordinance, 20 were under the Waste Disposal Ordinance, and 6 were under the Water Pollution Control Ordinance.

The heaviest fine in June was \$58,000, assessed against a restaurant for discharging wastewater into the water control zone.

***July 2018***

Thirty-nine convictions were recorded in July 2018 for breaches of legislation enforced by the Environmental Protection Department.

Five of the convictions were under the Air Pollution Control Ordinance, 6 were under the Noise Control Ordinance, 27 were under the Waste Disposal Ordinance, and 1 was under the Water Pollution Control Ordinance.

The heaviest fine in July was \$25,000, assessed against a construction company for using powered mechanical equipment without valid construction noise permit.

***August 2018***

Forty-four convictions were recorded in August 2018 for breaches of legislation enforced by the Environmental Protection Department.

Six of the convictions were under the Air Pollution Control Ordinance, 6 were under the Noise Control Ordinance, 28 were under the Waste Disposal Ordinance, and 4 were under the Water Pollution Control Ordinance.

The heaviest fine in August was \$50,000, assessed against a person which imported controlled waste without a permit.

***September 2018***

Thirty-three convictions were recorded in September 2018 for breaches of legislation enforced by the Environmental Protection Department.

Seven of the convictions were under the Air Pollution Control Ordinance, 5 were under the Noise Control Ordinance, 20 were under the Waste Disposal Ordinance, and 1 was under the Water Pollution Control Ordinance.

The heaviest fine in September was \$58,000, assessed against a company which discharged waste/polluting matter into the water control zone.

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