

EEO/AM/13

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30 January 2004

Clerk to Panel on Economic Services
Legislative Council Secretariat
Legislative Council Building
8 Jackson Road
Central
Hong Kong
(Attn.: Ms. Debbie YAU)

Dear Ms. YAU,

Panel on Economic Services & Panel on Environmental Affairs
Joint Meeting Held on 18 July 2003

With reference to paragraph 20 of the minutes of the Joint Meeting of the Panels on Economic Services and Environmental Affairs held on 18 July 2003, EMSD was requested to work with the Government Economist to see if it might be possible to work out rough estimates of the environmental and social costs of conventional power generation. In this context, we submit the following information to the Joint Panel based on a thorough literature review carried out by us on related local and overseas studies:

According to evidence from available local and international studies, the two major elements determining the social and environmental costs are: (i) the local health cost borne by the local community, and (ii) the damage due to global warming effect borne by the global community. The combined damage effects caused by these two elements include mortality, morbidity, coastal impact, agricultural impact, energy demand and economic impact due to temperature change and sea level rise.

Local health cost

"The Study of Economic Aspects of Ambient Air Pollution on Health Effects", a study conducted by EHS Consultants Limited for EPD in April 1998, found that the health-related economic costs arising from an increase of $1 \mu\text{g}/\text{m}^3$ of the relevant air pollutants in the ambient, estimated by the Cost-of-illness (COI¹) approach and Willingness-to-pay (WTP²) approach, were :

	COI (HK\$M)	WTP (HK\$M)
NO ₂	73.0	105.1
SO ₂	9.7	16.7
RSP	28.3	42.0
O ₃	49.7	73.5

However, complicated meteorological factors make it difficult to quantify the relationship between the amount of air pollutants emitted by power plants and the ambient concentration of these pollutants.

Damage due to global warming effect

We have also reviewed a number of international studies on evaluating the social and environmental costs of carbon dioxide emission. An international study conducted by UNEP Intergovernmental Panel on Climate Change (IPCC) in 1996 gave the figures between US\$9 (HK\$68) to US\$197 (HK\$ 1,478) per tonne of carbon (in 2000 price). Another study conducted by R. Clarkson and K. Deyes for UK HM Treasury & Department of Environment, Food & Rural Affairs (DEFRA) in January 2002 titled "*Estimating the Social Cost of Carbon Emissions*" quoted a figure in the same order of magnitudes £70 per tonne of carbon (in 2000 price) as the point estimate for the marginal damage caused by the global warming effect due to the increase in carbon dioxide emission and the range of £35 (HK\$438) to £140 (HK\$1,750) per tonne of carbon for sensitivity analysis.

¹ The concept of COI is to trace the cost impacts through the number of hospital admissions, morbidity, loss of work, etc.

² The concept of WTP is to establish the cost by surveys of what people

However, there are a number of uncertainties associated with the damage cost figures on carbon emission suggested by DEFRA. These uncertainties can be summarised into two categories: (i) scientific uncertainties such as measurement of present, and prediction of future emissions; translation of emissions levels to changes in the atmospheric concentration of carbon, etc. and (ii) the uncertainties associated with economic valuation such as predicting how the relative and absolute value of impacts will change in the future; estimating monetary values for non-market impacts (i.e. those impacts for which a market based price does not exist), etc. Due consideration should therefore be given to these uncertainties when applying IPCC or DEFRA's figures in estimating the damage costs of global warming effects.

Yours sincerely,

(HO Kwong-wai)
for Director of Electrical & Mechanical Services

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SETW	(Attn.: Mr. Fletch CHAN, Fax. 2136 3347)
Government Economist	(Attn.: Mr. Andrew AU, Fax. 2866 8869)
DEP	(Attn.: Mr. S.W. PANG, Fax. 2827 8040)

kml/tpu/kwh

are willing to pay to avoid the pollution.