

能源工業對環境之衝擊

Impact of Energy Industries on the Environment

5.1 一般名詞	5.1 General Terms
5.1.1 環境污染 影響人類、動物及植物生命之任何人為對環境的有害改變。	5.1.1 Environmental pollution Any detrimental alteration to the environment caused by man and affecting human, animal and plant life.
5.1.2 污染償付原則 生產或使用能源者造成環境傷害則應負擔環境復原改善費用的原則，此項費用應成為生產成本的一部分。	5.1.2 Polluter pays principle The principle that those causing environmental harm by producing or utilising energy shall bear the cost of its remedy, i.e. such cost shall become a component in the cost of the product.
5.1.3 廠址準則 決定廠址位置的適合性所應遵守的一些準則，由環境觀點，這些準則適用於工廠之施工與運轉，對當地居民健康與安全的危險度，對空氣、水、土壤的污染程度，以及對當地一般舒適的影響。考慮的因素應包括：現有的污染程度、水的冷卻容量、人口密度、地區經濟結構、地形、地質，地區發展本質、風向、地震危險度等。	5.1.3 Site criteria Those criteria that must be applied when deciding on the suitability of a location for a plant. From the point of view of the environment, such criteria would apply to the effect of the construction and operation of the plant on the health and safety risk to the local population, on levels of air, water and soil pollution and on local amenities in general. Factors to be considered would include: existing levels of pollution, cooling capacity of waters, population density, regional economic structure, topography, geology, nature of regional development, wind direction, earthquake risks.
5.2 環境之物質污染	5.2 Material Pollution of the Environment
5.2.1 空氣污染 對周圍空氣的任何人為之有害改變。	5.2.1 Air Pollution Any detrimental alteration of the ambient air caused by man.
5.2.2 排放 由發生源釋放物質或能量（例如：噪音、震動、輻射、熱量）於環境中。	5.2.2 Emission The release of substances or energy (e.g. noise, vibration, radiation, heat) into the environment from a source.
5.2.3 (污染物) 地面濃度 在某一特定地點，傾注某些物質或能量（例如：噪音、震動、輻射、熱量），致使人類、植物及動物的	5.2.3 Ground level concentration (of pollutants); immission (SA) The incidence of substances or energy (e.g. noise, vibration,

<p>環境條件遭受有害的改變。</p>	<p>radiation, heat) in a specified place, whereby environmental conditions for man, plants and animals become detrimentally altered.</p>
<p>5.2.4 污染源；污染排放源 釋放某些物質或能量（例如：噪音、震動、輻射、熱量）進入環境的工廠或設備。</p>	<p>5.2.4 Pollution source; pollution emitter Plant or equipment that releases substances or energy (e.g. noise, vibration, radiation, heat) into the environment.</p>
<p>5.2.5 排放點；點源 釋放某些物質或能量進入環境的源始點。</p>	<p>5.2.5 Emission point; point source A point at which substances or energy are released into the environment.</p>
<p>5.2.6 排放標準 按照法律規定，不得超過的排放水準。</p>	<p>5.2.6 Emission standard A level of emission that under the law may not be exceeded.</p>
<p>5.2.7 周圍空氣（水）品質標準 按法律規定，周圍空氣（水）必須維持的品質水準。</p>	<p>5.2.7 Ambient air (water etc.) quality standard; immission standard (SA) A level of ambient air (water, etc.) quality that under the law must be maintained.</p>
<p>5.2.8 工作場所限閾值 (TLV)；職業性限閾值；工作場所最大容許濃度 (MAC)；職業性最大容許濃度 作業環境空氣中某一污染物對作業人員每日 8 小時連續曝露而不致於損害其健康的最大容許濃度。</p>	<p>5.2.8 TLV (threshold limit value) at place of work; occupational TLV; MAC(maximum allowable concentration) at place of work; occupational MAC The maximum allowable concentration of air polluting substances that, in continued and generally daily 8-hour impact on the human organism, is not damaging to health.</p>
<p>5.2.9 自由環境限閾值；自由環境最大容許濃度 在自由環境內，空氣中污染物在特定期間與頻次下，不致於對某地區的人類、動物及植物造成損害的最大容許濃度。</p>	<p>5.2.9 TLV(threshold limit value) in the free environment; MAC(maximum allowable concentration) in the free environment The maximum concentration of air polluting substances in the free environment whose impact when of specified duration and frequency is not objectionable to man, fauna and flora.</p>
<p>5.2.10 瞬間濃度 地區性周圍污染物在某一特定瞬間的濃度。</p>	<p>5.2.10 Instantaneous concentration Regional ambient pollutant concentration at a specified point in time.</p>
<p>5.2.11 空氣污染物 使空氣的自然成分發生有害改變的物質。</p>	<p>5.2.11 Air pollutants Substances that detrimentally alter the natural composition</p>

<p>5.2.12 排氣；廢氣 由固定的工廠、器具、以及由內燃機推動的車輛所排入大氣中的氣體。</p>	<p>of the air.</p> <p>5.2.12 Exhaust; waste gases Gases vented to atmosphere by stationary plant and appliances and by internal combustion engine driven vehicles.</p>
<p>5.2.13 氣態的燃燒產物；煙道氣 在燃燒的過程中產生的氣體。</p>	<p>5.2.13 Gaseous combustion products; flue gases Gases that arise in combustion processes.</p>
<p>5.2.14 薰煙 在一氣態載體中，含有濃密的固態與液態粒子以及可見的氣體。</p>	<p>5.2.14 Fumes A concentration of solid and liquid particles, and visible gases in a carrier gas.</p>
<p>5.2.15 充氣排放；霧氣；煙柱 由工業製造程序排出充滿飽和水蒸汽且常含有固態、液態、或氣態污染物的空氣。</p>	<p>5.2.15 Steam-laden emissions; mists; plumes Air, supersaturated with water vapour and often containing solid, liquid or gaseous contaminants, that is vented from industrial processes.</p>
<p>5.2.16 塵埃 分散在氣態載體中的固態微粒。</p>	<p>5.2.16 Dust Solid particulate matter in disperse phase in a carrier gas.</p>
<p>5.2.17 含塵量 分散在單位體積的氣態載體中之固態粒子數目或質量。</p>	<p>5.2.17 Dust content The mass or number of solid particles dispersed in unit volume of carrier gas.</p>
<p>5.2.18 煤煙 不完全燃燒所產生的非結晶形碳之微細粒子。</p>	<p>5.2.18 Soot Fine-grained particulate amorphous carbon occurring as the result of incomplete combustion.</p>
<p>5.2.19 煙霧 在特殊氣象條件下，光化學來源產生的濃度空氣污染物。</p>	<p>5.2.19 Smog A concentration of air pollutants occurring under particular meteorological conditions, generally of photo-chemical origin.</p>
<p>5.2.20 氣態懸膠體 分散在氣態媒介中的膠狀懸浮粒子。</p>	<p>5.2.20 Aerosols Suspended particles colloiddally dispersed in a gaseous medium.</p>
<p>5.2.21 煙柱高度 由於熱與動力產生的浮力作用，因而引起排放點高度與煙柱上升高度間的差值。</p>	<p>5.2.21 Plume-rise The difference between the height of the emission point and the height to which the emissions rise due to thermally or kinetically induced buoyancy.</p>
<p>5.2.22 水污染 地面水、地下水、或海洋環境因任何人為之有害改變。</p>	<p>5.2.22 Water pollution Any detrimental alteration of surface waters, underground waters or the marine environment caused by man.</p>
<p>5.2.23 水污染物 使水的天然條件遭受有害改變的物質（固態、液態、或氣態）。</p>	<p>5.2.23 Water pollutants Solid, liquid and gaseous substances that detrimentally alter the natural condition of waters.</p>

5.2.24 排水 經家庭或工商業使用後排出的水，亦包括自工業區流出受污染的雨水。	5.2.24 Aqueous effluent Water discharged after use by households, trade or industry, also polluted rainwater from an inhabited area.
5.2.25 水污染的原先水準 原先已遭受物質污染與熱污染的用水。	5.2.25 Initial level of water pollution The material and thermal pollution of water prior to the use under consideration.
5.2.26 水質 地面水按其受污染的程度而劃分類別。	5.2.26 Water quality The classification of surface waters categorising their degree of pollution.
5.2.27 濁水 含有膠狀擴散狀態的水。	5.2.27 Turbid water Colloid disperse systems in water.
5.2.28 土地污染；土壤污染 土地或土壤遭受任何人為之有害改變。	5.2.28 Land pollution; soil pollution Any detrimental alteration to land or soil caused by man.
5.2.29 土地污染物；土壤污染物 使土地或土壤遭受有害改變之固態、液態、或氣態物質。	5.2.29 Land pollutants; soil pollutants Solid, liquid and gaseous substances that detrimentally alter the natural condition of the soil or land.
5.2.30 污染落塵；落塵；沉積 大氣中污染物每單位時間所沉積於單位面積上的數量。	5.2.30 Contaminant fall-out; fall-out; deposition The quantity of polluting material precipitated from the atmosphere per unit area per unit time.
5.2.31 沖洗；大氣清洗作用 空中污染物隨天然雨雪沉降於地面上，使大氣獲得清洗的作用。	5.2.31 Wash-out; atmospheric scrubbing The cleansing of the atmosphere by natural precipitation (rain or snow) entraining airborne contaminants to the surface of the earth.
5.2.32 可用副產品；可用廢產品 固態或液態可貯存之殘餘物料，與原產品規格不完全一致，但仍具有使用價值者。	5.2.32 Usable by-products; usable waste products Solid or liquid, storable, residual materials of varying consistencies to which a value can be attached.
5.2.33 燃燒殘餘物；灰燼 燃燒後仍遺留的惰性或不可燃性物質。	5.2.33 Combustion residue; ash Inert or unburned matter remaining after a process of combustion.
5.3 環境之熱污染	5.3 Thermal Pollution of the Environment
5.3.1 廢熱 工業熱製造程序中，未曾加以利用而排放於周圍空氣、土壤、或水中的熱能。	5.3.1 Waste heat Heat energy that has not been utilised an industrial thermal process and is released to the surrounding air, soil or

<p>5.3.2 熱負載 由水、土壤或空氣吸收的廢熱。</p> <p>5.3.3 溫升；遞進熱量 冷卻系統中冷卻媒介的出口與入口溫度間之差額。</p> <p>5.3.4 熱負載計畫 為維持生物平衡，現在或將來之水、土壤、空氣的熱負載之計畫。</p>	<p>waters.</p> <p>5.3.2 Thermal load The waste heat absorbed by waters, soil or the atmosphere.</p> <p>5.3.3 Temperature rise; incremental heating The difference between the outlet and inlet temperatures of the cooling medium in a cooling system.</p> <p>5.3.4 Heat load plan A plan of existing and future thermal loading of waters, soil or the atmosphere so as to maintain biological equilibrium.</p>
<p>5.4 環境之噪音污染</p>	<p>5.4 Noise Pollution of the Environment</p>
<p>5.4.1 音壓水準 在能聽度的低限區域內，有效音壓與參考音壓間比率的對數值。在英語國家，音壓水準的單位為「分貝」，即該音壓與參考音壓之比率對數值之二十倍。</p> <p>5.4.2 音壓譜 音壓水準繪製為頻率函數的圖表。</p> <p>5.4.3 音源 任何能以成音頻率震動的固態、液態、或氣態之系統或媒介。</p> <p>5.4.4 噪音劑量 在某一特定地點之某一特定時段內，所計測與衡量的音壓水準。 (註) 本名詞尚無正確的簡單名詞，「噪音劑量」或「噪音傾注水準」或可用以表達本名詞之內涵，但其使用應加以明確的定義。</p>	<p>5.4.1 Sound pressure level The logarithm of the ratio of effective sound pressure to reference sound pressure (in the region of the threshold of audibility). In English-speaking countries the unit of sound pressure level is the decibel which is defined as 20 times the logarithm of the ratio of the sound pressure in question to the reference sound pressure.</p> <p>5.4.2 Sound pressure spectrum The sound pressure level plotted as a function of frequency.</p> <p>5.4.3 Sound source; noise source Any solid, liquid or gaseous system or medium able to vibrate in the range of audible frequencies.</p> <p>5.4.4 The metered and weighted sound pressure level at a specific place over a specific period of time. Note. There is no exact English equivalent for this term. The terms “noise dose” or “noise immission level” may convey the meaning of this term in certain contexts, but where precision is required the term used should be defined, as certain commonly employed terms do not yet have established definitions.</p>

5.5 環境之放射性污染	5.5 Radioactive Pollution of the Environment
<p>5.5.1 人為或天然的游離輻射對個人、羣體、或全人口的入射。按不精確的說法，「曝露」一詞可表達本名詞所代表的意義，但宜謹慎使用，以免與 4.5.5 所解釋的「曝露」定義相混淆。</p>	<p>5.5.1 The incidence of man-made or natural ionizing radiation on persons, groups of the population or the whole population. The word “exposure” may convey the meaning of this term when used in a loose sense, but care should be taken not to confuse this meaning with the precise meaning of the term exposure as defined in 4.5.5</p>
<p>5.5.2 游離輻射 請參閱 4.5.17 定義。</p>	<p>5.5.2 Ionizing radiation See definition 4.5.17.</p>
<p>5.5.3 最大容許濃度 請參閱 4.5.20 定義。</p>	<p>5.5.3 Maximum permissible concentration See definition 4.5.20.</p>
<p>5.5.4 劑量 請參閱 4.5.2 定義。</p>	<p>5.5.4 Dose See definition 4.5.2.</p>
<p>5.5.5 等效劑量 請參閱 4.5.7 定義。</p>	<p>5.5.5 Dose equivalent See definition 4.5.7.</p>
<p>5.5.6 射質因數 請參閱 4.5.6 定義。</p>	<p>5.5.6 Quality factor A factor depending on the linear energy transfer in water of primary or secondary charged particles, by which absorbed dose is multiplied to obtain, according to practice in the field of radiation protection, an evaluation on a common scale, for all ionizing radiations, of the irradiation incurred by exposed persons.</p>
<p>5.5.7 最大容許等效劑量 請參閱 4.5.8 定義。</p>	<p>5.5.7 Maximum permissible dose equivalent (MPDE) See definition 4.5.8.</p>
<p>5.5.8 人口劑量 一地人口中，人體全身或特定器官以等效劑量表示的總曝露之度量，人口劑量以倫目表示之。 (註)本名詞的完整定義請參閱國際輻射防護委員會第 22 號出版物。</p>	<p>5.5.8 Population dose A measure of the total exposure of the whole body or a specified organ of a population or people in terms of dose equivalent. The population dose is given in rems. Note. For a fuller definition see: Publication No.22 of the International Commission on Radiological Protection.</p>
<p>5.5.9 羣體或部分人口集合劑量 請參閱 4.5.11 定義。</p>	<p>5.5.9 Group/sub-population collective dose A component of the population dose (see 5.5.8 above) related to a given sub-population, which , for some purposes,</p>

<p>5.5.10 攝入 請參閱 4.5.16 定義。</p> <p>5.5.11 放射性落塵 請參閱 4.5.12 定義。</p> <p>5.5.12 放射性廢料 請參閱 4.6.1 定義。</p>	<p>msy be the population of a country or region. The group/sub-population collective doses is measured in rems.</p> <p>5.5.10 Intake See definition 4.5.16.</p> <p>5.5.11 Radioactive fall-out The deposition upon the surface of the earth or radioactive substances from the explosion of a nuclear device or from their accidental release.</p> <p>5.5.12 Radioactive waste See definition 4.6.1.</p>
<p style="text-align: center;">5.6 環境之地形衝擊</p>	<p style="text-align: center;">5.6 Topographical Impact on the Environment</p>
<p>5.6.1 土地的取得 經由合約、強制力的運用、或經由中央政府、公立或地方主管機關、國營工業、或經任何其他個人、法人組織或公司，以取得土地上任何權利或利益（包括土地上的建築物、樹木或水）。開採權或特許權為特殊型的土地取得，可經由合約使營運者獲得租用或特許以探勘及開採礦藏。</p> <p>5.6.2 土地侵擾；土地惡化 在未經損害的土地上傾倒或進行破壞性工作，特別指露天採礦活動。</p> <p>5.6.3 (土地與水的) 地力重建 完成能源目的之商業利用之後，將地層表面(土地與水)轉為商業上可用之土地、森林、與水或其他使用目的，包括開墾與隨後的復耕。</p> <p>5.6.4 (土地與水的) 開墾 促使先前用於能源目的之地層表面(土地與水)適合於復耕的各種措施。</p>	<p>5.6.1 Acquisition of land The acquisition of any right or interest in land (including land covered by buildings, trees or water) whether by agreement or by the exercise of compulsory powers and whether by the Crown, a public or local authority, nationalized industry or any other person, corporate or incorporate. A concession is a special case of the acquisition of land, whereby a lease or licence is granted by agreement to operators to prospect for and work mineral deposits.</p> <p>5.6.2 Land disturbance; land degradation The destructive working of, or dumping on, unspoilt land, with particular reference to surface mining activities.</p> <p>5.6.3 Rehabilitation (of land and waters) The conversion of surface areas (lands and waters), after their commercial utilisation for energy purposes is completed, to commercially useful lands, forests and waters or to other useful purposes. This comprises reclamation and subsequent recultivation.</p> <p>5.6.4 Reclamation (for land and waters) Measures taken to render surface areas (lands and waters), formerly utilised for</p>

<p>5.6.5 復耕 為使新生地能永久生產利用所採取的各種措施。</p> <p>5.6.6 傾卸管制 適當管制的廢物堆積。</p>	<p>energy purposes, fit for recultivation.</p> <p>5.6.5 Recultivation Measures taken to ensure the permanent and productive utilisation of reclaimed areas.</p> <p>5.6.6 Controlled dumping The properly regulated deposition of waste products.</p>
<p>5.7 增訂名詞</p>	<p>5.7 Additional Terms</p>
<p>5.7.1 下陷 就地下採礦而言，下陷即礦區經開採後之地面下陷。採礦後由於留下了空間，造成岩層間結構不穩定，導致岩石崩坍落入空處，並造成地面下陷。上述現象亦可能因礦坑中遺留之支柱無法長久承受負荷，故經常在停止採礦長時間後發生。下陷亦可能因開發地熱能或開採油氣使得地下壓力減低而造成。</p> <p>5.7.2 二氧化碳溫室效應 二氧化碳幾可容可見光透過，却可作為紅外線輻射之吸收體，尤其是波長在 12~18 微米 (μm) 時，具單向過濾的特性，容許進入之可見光單向穿過，但阻止反方向外離之紅外線輻射通過。 (註) 二氧化碳之單向過濾效應，空氣中其他組成成份如氮氧化物亦有此特性但程度較低，其吸收大氣中之過量紅外線輻射，作用如同溫室一樣，能增加地面之溫度。參見 7.1.20。</p>	<p>5.7.1 Subsidence Relative to underground mining, subsidence is a sinking into the area that has been mined. The void left after the extraction of the mined material often produces a condition of instability within the rock structure leading to collapse of the overlying rock into the void and possible ultimate surface subsidence. This may occur when the pillars or supports left in the ground are no longer able to carry the overburden weight. The sequence described may occur long after the cessation of mining. Subsidence may also result from release of subterranean pressure in connection with gas recovery or geothermal energy exploitation.</p> <p>5.7.2 Carbon dioxide greenhouse effect Carbon dioxide, being nearly transparent to visible light but an absorber of infrared radiation especially at wavelengths between 12 and 18 microns, behaves as a one-way filter allowing incoming visible light to pass through in one direction but preventing the outgoing infrared radiation from passing in the opposite direction. Note This one-way filtering effect of carbon dioxide, exercised also to a less significant degree by other constituents of the air, e.g. oxides of nitrogen, by trapping an excess of the infrared radiation in the atmosphere, acts in the manner of a</p>

<p>5.7.3 人為地震／地面震動 地震或地面之震動係由於人為的貫穿地殼，開採地下資源如採礦，取出石油、天然氣和地熱能所造成。</p> <p>(註)通常人為地震或地面的震動發生之原因，是因為部份地殼發生壓力改變。因此於地下操作前，應先行了解地殼壓力狀況此一重要因素。天然地震活動頻繁之地區較無地震活動紀錄之地區更易產生強烈之人為地面震動。根據目前觀察，除已知地面之震動與採礦時地面下陷以及爆破岩石有關之外，亦知水壩所在地之地震活動與在壓力下排放廢水進入石塊裂縫所造成之震動有關。至於抽取地熱流體後，地殼冷卻而導致地震和地面震動之現象則尚待考察。</p>	<p>greenhouse with a potential for increasing the surface temperature of the earth. See 7.1.20.</p> <p>5.7.3 Man-made earthquakes/earth tremors Earthquakes or earth tremors caused by man's penetration of the earth's crust in such operations as mining, e.g. coal mining, or the extraction of other energy sources such as oil, natural gas and geothermal energy.</p> <p>Note The common cause of man-made earthquakes or earth tremors are the changes in pressure that such activities bring about in parts of the earth's crust, whereby the pressure conditions prevailing prior to the underground operations are an essential factor. (In a zone of high natural seismic activity a more powerful man-made tremor could result than) in a zone with no previous record of seismic activity.</p> <p>To-date tremors associated with rock bursts and with subsidence in mining, also seismic activity at dam sites and earthquakes and tremors due to the discharge under pressure of waste waters into fissured rock have all been observed. Yet to be experienced are earthquakes or earth tremors caused by the cooling of zones of the earth's crust due to the extraction of geothermal fluids.</p>
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