

出國報告（出國類別：其他）

第 19 屆臺澳能礦諮商會議出國報告

服務機關：核能研究所

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派赴國家：澳洲

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摘要

此次出國的主要目的，係出席在澳洲新堡舉行之第 19 屆臺澳能礦諮商會議。本次會議之議題包括「政策發展與合作概況」、「能礦投資與貿易之機會」、「潔淨能源合作」及「未來合作策略」等四項。

會議由我方經濟部能源局歐局長嘉瑞與澳洲產業部潔淨能源與環境處(Clean Energy and Environment Division) Ms. Margaret Sewell 處長共同主持，並由台澳雙方與會代表就各項議題分別提出報告。

我方報告內容包括臺灣能源政策概況、臺灣對澳洲礦產與金屬之需求、「第 18 屆臺澳能礦諮商會議」行動計畫執行進展之檢討及未來展望、臺灣液化天然氣供需及展望、台電公司之原料鈾需求、台電公司煤炭需求及礦產投資、中鋼原料供需及投資概況、臺灣再生能源推廣政策及定價機制、臺灣二氧化碳捕獲與封存技術進展、臺灣太陽光電產業之優勢與合作前景、臺灣 LED 照明產業發展現況與臺澳合作展望、創新低碳損生質丁醇技術、臺灣 ORC 熱電轉換能力等；澳方報告內容包括澳洲資源與能源政策概況、澳洲石油及 LNG 供需，包括 2012 與 2013 年外海油氣探勘區塊礦權釋出及非傳統天然氣、澳洲 Ichthys 液化天然氣計畫、澳洲稀土與鈾礦政策及產業發展、澳洲煤炭與鐵礦供需及基礎設施、澳洲煤炭產業之展望與機會、Port Waratah 煤炭服務概況、臺灣在澳洲的商業機會、太陽能產業合作與機會、澳洲近期 CCS 發展、智慧電網合作備忘錄進度報告、次世代太陽能電池、零耗能建築、澳洲生質燃料研究概況及產業發展、「太陽能製冷、微型電網、聚光型太陽能發電、廢棄物轉換能源」、「2013-2014 工作計畫」等。

雙方於簡報中說明兩國相關能源政策、產業機會與科技發展現況。與會代表對能源相關議題有熱烈的討論，雙方並提出未來合作之具體項目。

透過彼此之經驗分享與互動討論，將可進一步強化兩國能源合作範圍，包括分享政策經驗、促進產業發展機會與技術交流合作，持續推動雙方實質合作，對台澳推動潔淨能源策略、產業交流與科技發展，有具體實質之助益。

目 次

一、目的.....	1
二、過程.....	2
三、心得.....	13
四、建議.....	14
五、附件.....	15

附件一、台方出席會議代表團名單

附件二、澳方出席會議代表團名單

附件三、第 19 屆台澳臺澳能礦諮商會議議程

一、目的

行政院原子能委員會核能研究所配合行政院組改，將移入經濟及能源部，並更名為能源研究所。本所將在既有的能源研究堅實基礎上，朝向我國能源智庫之角色邁進。因此為逐步融入新組織體系，爰自 100 年起，在經濟部能源局邀請下，開始參與「台澳能礦諮商會議」，以加強能源領域之政策規劃與推動實務。

從能源局網頁之說明¹，台澳雙邊貿易關係在 2011 年，台澳雙邊貿易總額達 132 億美元，較 2010 年成長約 9%；就貿易結構而言，歷年台灣自澳洲進口之主要產品，以能礦產品為大宗。2011 年，自澳洲進口礦物及金屬排名在前 10 名之進口總量為 4,524 萬公噸，占該年台灣自澳洲進口總量 4,698 萬公噸之 96.30%。此外，澳洲亦為台灣鋁、鐵及銅礦之主要供應國。

由此可見，澳洲扮演我國能源貿易之重要往來地位，故台澳雙方為瞭解彼此之能礦政策，促進能礦及資源加工之聯合開發、貿易及投資之參與，以提高長期雙邊合作並激勵雙方商務關係之發展，乃於 1992 年 10 月底提議建立雙方能礦部門政策諮商管道，定期討論雙方關切事項。1993 年 12 月在澳洲坎培拉舉辦「台澳能礦諮商會議」，雙方就亞 APEC 能源工作發展情形及兩國間石油、天然氣、煤炭、電力等之合作相關議題進行廣泛意見交換，並以每年定期由兩國輪流召開的模式進行；兩國更在 2009 年第 16 屆會議時簽訂「台澳能礦合作備忘錄」。

能礦投資合作上，我國近年亦擴大在澳洲的投資計畫，包括台電煤炭投資計畫、中鋼公司投資計畫，以及台灣中油公司在澳洲礦區合作探勘及生產，成為我國能礦資源的重要來源。此外，中油公司為擴增自有油源，提高能源供應穩定性，與澳洲合作油氣探勘開發，並於 2013 年 2 月 27 取得該公司在澳洲西北海域 Prelude 天然氣田開發生產計畫 5% 權益。

綠能及能源相關技術方面，台澳雙邊亦建立不少產學研間的合作交流管道，分別在太陽光電領域、碳捕捉與封存技術、能礦投資及合作勘採計畫等相關領域進行資訊交流與技術開發。

透過台澳定期舉辦「台澳能礦諮商會議」，討論雙方關切事項，迄今已歷

¹ http://web3.moeaboe.gov.tw/ECW/populace/content/Content.aspx?menu_id=416

18 屆，對促進雙邊之能礦技術合作助益甚大。2010 年 8 月台澳雙方在台灣簽署了「台澳能礦合作備忘錄」，於此架構下，台灣與澳洲除了能礦探勘與發展外，合作亦擴及至清潔能源、低碳排放與再生能源技術等領域。

此次出國的主要目的，係出席今（102）年 10 月 30 日~11 月 1 日在澳洲新堡舉行之第 19 屆「台澳能礦諮商會議」。本次會議之議題包括「政策發展與合作概況」、「能礦投資與貿易之機會」、「潔淨能源合作」及「未來合作策略」等四項。

本次會議我方代表團由經濟部能源局歐局長嘉瑞率團，參與單位包括經濟部能源局、經濟部礦物局、駐澳代表處、駐雪梨辦事處、核研所、台電、台電雪梨辦事處、中油、中鋼、工研院/LED 聯盟、士林電機、台達澳洲及台灣經濟研究院等，共計 26 位代表出席。

澳方則由 Department of Industry、Department of Foreign Affairs and Trade、Commonwealth Scientific and Industrial Research Organization (CSIRO)、Austrade、Australia-Taiwan Business Council、ARENA、NSW Trade and Investment、Minerals Council of Australia、Port Waratah Coal Services、Newcastle Institute of Energy and Resources、OneSteel、Oceanlinx Limited、MGT Resources、ClarkeKann Lawyers、Goodman Lawyers、CLEANaS、Resources Law Group、ClarkeKann Lawyers、INPEX、University of New South Wales、The University of Newcastle 等產官學研各界，並包含當地台商，代表出席，共計 39 名（名單詳如附件一、二）。

二、過程

（一）第 19 屆台澳能礦諮商會議概況

第 19 屆「台澳能礦諮商會議」於 10 月 30 日~10 月 31 日在澳洲新堡 Crowne Plaza Hotel 舉行。會議由我方經濟部能源局歐局長嘉瑞與澳洲產業部潔淨能源與環境處(Clean Energy and Environment Division) Ms. Margaret Sewell 處長共同主持，並由台澳雙方與會代表就各項議題分別提出報告。

我方報告內容包括臺灣能源政策概況、臺灣對澳洲礦產與金屬之需求、「第

18 屆臺澳能礦諮商會議」行動計畫執行進展之檢討及未來展望、臺灣液化天然氣供需及展望、台電公司之原料鈾需求、台電公司煤炭需求及礦產投資、中鋼原料供需及投資概況、臺灣再生能源推廣政策及定價機制、臺灣二氧化碳捕獲與封存技術進展、臺灣太陽光電產業之優勢與合作前景、臺灣 LED 照明產業發展現況與臺澳合作展望、創新低碳損生質丁醇技術、臺灣 ORC(Organic Rankin Cycle) 熱電轉換能力等。

澳方報告內容包括澳洲資源與能源政策概況、澳洲石油及 LNG 供需，包括 2012 與 2013 年外海油氣探勘區塊礦權釋出及非傳統天然氣、澳洲 Ichthys 液化天然氣計畫、澳洲稀土與鈾礦政策及產業發展、澳洲煤炭與鐵礦供需及基礎設施、澳洲煤炭產業之展望與機會、Port Waratah 煤炭服務概況、臺灣在澳洲的商業機會、太陽能產業合作與機會、澳洲近期 CCS 發展、智慧電網合作備忘錄進度報告、次世代太陽能電池、零耗能建築、澳洲生質燃料研究概況及產業發展、「太陽能製冷、微型電網、聚光型太陽能發電、廢棄物轉換能源」、「2013-2014 工作計畫」等。²

透過會議簡報與討論，除確認上次會議 Action Items 的進度，會議的重要工作就是在討論建立新的 Action Plan，包括：

1. Technology development and application of renewable energy,
2. Solar Technology,
3. LED Lighting System,
4. Energy Efficient Buildings,
5. Direct Current House,
6. Smart Grids,
7. Low emissions coal technologies including Carbon Capture and Storage,
8. Information on mine investment opportunities,
9. Cooperation on biofuels; ethanol and bio-butanol production and technology commercialization,

²第 19 屆台澳能礦諮商會議雙方簡報資料均有電子檔供參。

10. Enhance Taiwan and Australia cooperation under APEC ESCI-KSP,
11. Strategic partners of LNG production and sales,
12. Energy Efficiency,
13. Energy Modelling ◦

詳細的合作內容、雙方參與機構與現況彙整如下表。

19th Meeting of the Taiwan-Australia Joint Energy and Minerals, Trade and Investment Cooperation Consultations

Action Plan for Strategic Partnership - Areas for Taiwan-Australia Bilateral Cooperation

<u>Proposal</u>	<u>Cooperation Content</u>	<u>Agencies</u>	<u>Progress to Date</u>
1. Technology development and application of renewable energy	<p>Taiwan and Australia to establish communication channels between interested research and commercial entities to explore opportunities for the introduction of products, technologies, demand and potential applications, such as:</p> <ul style="list-style-type: none"> • NIER to develop a NSW Knowledge Hub for industry access to world leading knowledge and capabilities • NSW government keen to develop an energy technology and services centre for Asian region. • CSIRO seeking collaboration on solar cooling technology, waste to energy, organic rankine cycle technology • UNSW and CSIRO advanced in wind forecasting technology. 	<p><u>TAIWAN</u> Industrial Technology Research Institute (ITRI), Taipower, CPC Corporation Taiwan, China Steel Corp, Institute of Nuclear Energy Research (INER).</p> <p><u>AUSTRALIA</u> Possible collaborators: ARENA NSW Trade and Investment NIER CSIRO UNSW</p>	<p><u>Suggested way forward:</u></p> <p>Australia to consider the value of ORC in the application of renewable energy and energy efficiency. CSIRO, UNSW, NIER and other partners to establish collaborative initiatives with Taiwanese counterparts.</p>
2. Solar Technology	<ul style="list-style-type: none"> • Taiwan and Australia are collaborating on 	<u>TAIWAN</u>	<u>Suggested way forward:</u>

<u>Proposal</u>	<u>Cooperation Content</u>	<u>Agencies</u>	<u>Progress to Date</u>
	<p>joint development of next generation solar cell. IBC of solar cell will be focused in the initial stage.</p> <ul style="list-style-type: none"> • ITRI's strength: surface passivation, hetero-junction solar cell, laser process. • ANU's strength: high-efficiency solar cell, IBC back contact solar cell, laser technology, solar forecasting, grid integration, • UNSW strength: industry-friendly high efficiency silicon solar cells; hydrogen incorporation into silicon wafers to permit use of lower quality material; plated metal cell contacts; silicon based tandem cells; CZTS cells; perovskite cells; silicon cells on steel substrate; solar resource forecasting; concentrating solar thermal, including nanofluids. 	<p>ITRI as lead organisation</p> <p><u>AUSTRALIA</u></p> <p>Australian National University, UNSW and other relevant research entities.</p>	<p>ITRI as lead organisation to initiate this work.</p> <p>Dr Igor Skryabin, Energy Change Institute, ANU has been dealing direct with TECO.</p> <p>Dr Richard Corkish, UNSW.</p> <p>Collaboration in place with Sunrise Global and other Taiwanese companies.</p>
<p>3. LED Lighting System</p>	<ul style="list-style-type: none"> • Taiwan companies have rich experiences in promoting the adoption of LED street light. 	<p><u>TAIWAN</u></p> <p>ITRI</p>	<p><u>Suggested way forward:</u></p> <p>ITRI to progress this with CRC for</p>

<u>Proposal</u>	<u>Cooperation Content</u>	<u>Agencies</u>	<u>Progress to Date</u>
	<p>Based on the experiences, Taiwan may be interested in establishing strategic partnership with Australia, helping Australian government deploy LED street lights so as to boost the penetration of LED lighting in local market.</p> <ul style="list-style-type: none"> • The strategic partnership could be developed through establishing designated expert dialogue to routinely discuss LED lighting standards and exchange in-field testing experiences, and can also share the information of any relevant procurement of Australian with Taiwan's companies. 	<p><u>AUSTRALIA</u> CRC for Low Carbon Living at UNSW Department of Industry</p>	<p>LCL and Department of Industry</p> <p>Test Methods and Results.</p> <p>Taiwan is seeking APEC members consideration/agreement to:</p> <ul style="list-style-type: none"> – setup a standard of energy efficiency (level) and an LED testing/measurement standard in APEC region – cooperation or exchange of information between laboratories to prevent development overlapping.
<p>4. Energy Efficient Buildings</p>	<ul style="list-style-type: none"> • Taiwan's climate and building types are very similar to the southern east part of mainland China. Thus Taiwan can provide as a perfect incubation center for international companies and their products to be tested and demonstrated before entering mainland China's market. • Taiwan proposes to hold conferences and 	<p><u>TAIWAN</u> ITRI <u>AUSTRALIA</u> CRC for Low Carbon Living</p>	<p><u>Suggested way forward:</u> Taiwan to lead.</p> <p>ITRI and CRC for LCL to establish collaboration.</p> <p>Professor, Deo Prasad CRC for LCL keen to discuss the opportunity of</p>

<u>Proposal</u>	<u>Cooperation Content</u>	<u>Agencies</u>	<u>Progress to Date</u>
	<p>meetings to let relevant companies in the field of building energy efficiency from Taiwan and Australia to establish possible corporation.</p> <ul style="list-style-type: none"> • Australian companies are also welcome to join Taiwan's ZEBTA (Zero Energy Building Technology Alliance) to participate in the demonstration projects. • CRC for Low Carbon Living looking for collaboration on research projects relating to low carbon buildings, precincts, cities and communities. 		joining ZEBTA.
5. Direct Current House	<ul style="list-style-type: none"> • Taiwan has a complete supply chain in PV, rectifiers, inverters, and converters. Taiwan proposes both governments to jointly sponsor demonstration houses in Taiwan and in Australia, and to invite relevant companies and experts to investigate the safety standards and bring down the cost of realizing DC houses. 	<u>TAIWAN</u> ITRI <u>AUSTRALIA</u> CRC for Low Carbon Living	<u>Suggested way forward:</u> ITRI and CRC for LCL to explore collaboration opportunities.
6. Smart Grids	<ul style="list-style-type: none"> • Initial focus of collaboration will be in areas 	<u>TAIWAN</u>	<u>Suggested way forward:</u>

<u>Proposal</u>	<u>Cooperation Content</u>	<u>Agencies</u>	<u>Progress to Date</u>
	of common interest associated with research, development, deployment and commercialization of Smart Grid Technologies.	ITRI as lead agency <u>AUSTRALIA</u> NIER and commercial entities such as AusGrid.	NIER and ITRI to continue collaboration and seek wider industry involvement for roll-out of technologies.
7. Low emissions coal technologies including Carbon Capture and Storage	<ul style="list-style-type: none"> Taiwan and Australia seek to deepen the co-operation on Carbon Capture and Storage through collaborative demonstration and R&D partnerships. CSIRO has expertise in slurry fuels. 	<u>TAIWAN</u> ITRI as lead agency <u>AUSTRALIA</u> Minerals Council of Australia/ ACA Low Emissions Technology Ltd; CO2CRC; Global CCS Institute ; CSIRO	<u>Suggested way forward:</u> CSIRO, and ITRI to establish collaboration. ACALET supports CCS Research Development & Demonstration through the COAL21 fund. CO2CRC wishes to collaborate in capture, storage and economics of CCS.
8. Information on mine investment opportunities	<ul style="list-style-type: none"> Taiwan seeks further information on contacts within the resources and energy sectors to assist in identifying opportunities for investment. 	<u>TAIWAN</u> Taipower <u>AUSTRALIA</u> Department of Industry	<u>Suggested way forward:</u> Taiwan may like to provide more details about the type of information required so the contacts can be appropriately targeted.

<u>Proposal</u>	<u>Cooperation Content</u>	<u>Agencies</u>	<u>Progress to Date</u>
		Austrade Australian State Governments	Seek advice from Taiwan on what level of contact they wish to make. DOI can provide information on State/Territory head of department contacts and or with the Foreign Investment Review Board (which provides Foreign Investors with advice on the Government's investment policy).
9. Cooperation on biofuels; ethanol and bio-butanol production and technology commercialisation	<ul style="list-style-type: none"> Taiwan and Australia seek opportunities to form collaborative partnerships in the research, development and commercialization of ethanol and biofuel technologies. 	<u>TAIWAN</u> INER <u>AUSTRALIA</u> Microbiogen Bioenergy Plantations Australia Possible other partners: ARENA JCU Licella	<u>Suggested way forward:</u> Discussion between individual project partners to continue after JEMTIC.
10. Enhance Taiwan	<ul style="list-style-type: none"> Taiwan and USA are encouraging all APEC 	<u>TAIWAN</u>	<u>Australia</u>

<u>Proposal</u>	<u>Cooperation Content</u>	<u>Agencies</u>	<u>Progress to Date</u>
and Australia cooperation under APEC ESCI-KSP	members to participate in exchange of best practice for smart energy.	Bureau of Energy, Ministry of Economic Affairs <u>AUSTRALIA</u> Department of Industry	Dept of Industry to work closely with Taiwan on contributing to this platform.
11. Strategic partners of LNG production and sales	<ul style="list-style-type: none"> • Australia to share information on government policy on LNG development projects • Taiwan will share LNG supply and demand Information of Taiwan. Taiwan to evaluate and seek opportunities in LNG procurement and upstream investment. 	<u>TAIWAN</u> CPC Corporation, Taiwan (CPC) <u>AUSTRALIA</u> Department of Industry State Governments	
12. Energy Efficiency	<ul style="list-style-type: none"> • Enhance bilateral cooperation in Organic Rankine Cycle Heat to Power Conversion • Slurry fuels. 	<u>TAIWAN</u> Industrial Technology Research Institute (ITRI) <u>AUSTRALIA</u> CSIRO	ITRI and CSIRO to discuss.
13. Energy Modelling	<ul style="list-style-type: none"> • CSIRO energy economic modeling • ANU Energy Change Institute – policy, economics and sociology of energy 	<u>TAIWAN</u> Industrial Technology Research Institute (ITRI)	ITRI to discuss collaboration opportunities with CSIRO and ANU

<u>Proposal</u>	<u>Cooperation Content</u>	<u>Agencies</u>	<u>Progress to Date</u>
	generation, distribution and consumption.	<u>AUSTRALIA</u> CSIRO ANU	

(二) 參訪活動紀要

開會地點新堡 (Newcastle) 是澳大利亞新南威爾士州重要城市 and 港口，在雪梨東北方 120 公里，亨特河河口南岸，瀕臨塔斯曼海。人口約 41.5 萬人。位居全國最大的採煤區中心。重工業發達，有鋼鐵冶煉、機器製造、化工、造船、採礦等工廠。輕工業以食品加工較重要。輸出煤、鋼鐵、小麥、羊毛、凍肉等。

11 月 1 日，澳方安排參訪澳洲聯邦科學與工業研究組織太陽能發展中心 - 研究領域包括太陽能發電、太陽能製冷、微型電網、能源效率、電動車及智慧電網，澳洲新堡能礦資源研究所 - 參觀新實驗室等設施，以及 Waratah 港口 Kooragang 運煤碼頭。

三、心得

台澳能礦諮商會議為一工作會議，並非學術研討會性質，議程相當緊湊。我國駐澳張小月大使的全程參與，對於會議的進行與溝通協商，有相當大的幫助。而駐外單位的全程參與，包括外交與國營事業駐外單位，都對本次會議進行有相當大的助益。透過產官研的整合推動，並有國營事業的大型能源採購為契機，大幅增加國際合作機會與空間。

澳洲雖有豐富的煤礦、天然氣等資源，亦在積極推動太陽能百萬陽光屋頂計畫，成效頗豐，其主要原因在於民生電價高漲，因此民眾安裝意願高。另外會議中，澳方仍有發展核電之聲音，只是短期內若無能源短缺，仍不易推動。

針對再生能源發展領域，本所與澳洲 Microbiogen 合作，以該公司開發之酵母菌測試本所水解液。本所已將噸級廠所產稻稈前處理渣料及木糖水解液樣品提供給澳洲 Microbiogen 公司，該公司於六月底收到樣品，並於九月底來信表示已將本所提供之前處理稻渣完成酵素水解及發酵測試，並以該公司專利之酵母菌發酵 20 小時，結果顯示每克葡萄糖可產出酒精 0.47 克，生產率為 2.03 克酒精/L-h。

儘管該葡萄糖發酵轉化酒精的效果不錯，但較難發酵之木糖水解液，該公司則以糖份濃度偏低為理由，並未進行發酵測試。本所將持續與澳洲 Microbiogen

公司保持聯繫與交流，以持續拓展國際市場機會。

四、建議事項

- (一) 國際合作宜有專人長期投入：台澳能礦會議之各單位參與人員，不論我國或澳方，均多為長期參與此項工作。因此雙方人員彼此熟稔合作細節與追蹤管理，對於國際合作關係建立，有相當之效果。
- (二) 國際合作宜有經濟實力與科技創新實力為基礎：我國透過產官研的整合，並有國營事業的大型採購為經濟誘因，因此台澳能礦諮商會議已進行 19 屆。經濟因素應為本所推展國際合作的重要參考因素之一，而科技創新實力所能帶動的經濟效益龐大，亦為國際合作雙方考量的重點因素。本所在能源領域的科技創新實力已逐漸展現，宜逐漸加強在國際上的曝光率，以增強國際活動空間，並帶動產業發展國際市場。

伍、附 件

附件一、台方出席會議代表團名單

台 方 代 表 團

Chief Delegate

- Dr Jia-Ruey Ou (歐嘉瑞)
Director-General (局長)
Bureau of Energy, MOEA

Delegates

Bureau of Energy, MOEA 經濟部能源局 (1 人)

- Dr Jyuung-Shiauu Chern (陳炯曉)
Section Chief (科長)
Planning Division (綜合企劃組)

Taipei Economic and Cultural Office in Australia 駐澳大利亞代表處 (5 人)

- Ms Katharine Chang (張小月)
Ambassador (大使)
- Mr Andy Yih-Ping Liu (劉翼平)
Deputy Executive Director (副組長)
- Mr Meei-Jenn Shyy (史美振)
Executive Director (組長)
Economic Division (經濟組)
- Mr Chun Hsiao (蕭俊)
Director (簡任一等秘書)
Economic Division (經濟組)
- Mr Michael Liou (劉倫正)
Deputy Director (一等秘書)
Economic Division (經濟組)

Taipei Economic and Cultural Office in Sydney 駐雪梨臺北經濟文化辦事處 (2 人)

- Mr Joseph C.F. Chow (周進發)
Director General (處長)
- Mr Kevin Kuo (郭承凱)
Director (組長)

Department of Mines, MOEA 經濟部礦務局 (1 人)

- Mr Yet-Jen Chen (陳逸偵)
Concurrent Acting Deputy Director General (兼代副局長)

Institute of Nuclear Energy Research, Atomic Energy Council, Taiwan (INER) 行政院原子能委員會核能研究所 (1 人)

- Mr Hei-Kuang Lee (李海光)
Division Director (組長)
Planning Division (綜合計畫組)

Taiwan Power Company 台灣電力公司 (3 人)

- Mr Samson Lee (李博仁)
Deputy Director (副處長)
Department of Fuels (燃料處)
- Mr George C.C. Shiau (蕭朝景)
Section Chief, Fuels Planning Section (計劃組長)
Department of Fuels (燃料處)
- Mr Nien-Mien Chung (鍾年勉)
Manager (主任)
Energy Research Lab., Taiwan Power Research Institute (綜合研究所能源研究室)

Liaison Office in Australia, Taiwan Power Company 台電澳洲辦事處 (1 人)

- Mr Stanley C.M.Tsai (蔡春明)
Director (主任)

CPC Corporation, Taiwan 台灣中油公司 (1 人)

- Mr Huang-Chang Lee (李皇章)
Deputy CEO (副執行長)
Natural Gas Business (天然氣事業部)

China Steel Corporation (CSC) 中鋼公司 (3 人)

- Mr Chine-Jine Hsiao (蕭欽進)
Assistant Vice President (業務助理副總)
Commercial Division (業務處)
- Mr Yih-Feng Chiu (邱義豐)
General Manager (處長)
Resources Development Department (料源開發處)
- Mr Chun-Lung Wu (吳俊龍)
General Manager (處長)
Purchasing Department (採購處)

Industrial Technology Research Institute (ITRI) 工業技術研究院 (2 人)

- Dr Robert Yie-Zu Hu (胡耀祖)
Principal Researcher and Deputy General Director (副所長)
Green Energy and Environment Research Laboratories (綠能與環境研究所)
- Dr Ren-Chain Wang (王人謙)
Division Deputy Director (副組長)
Green Energy and Environment Research Laboratories (綠能與環境研究所)

Taiwan LED Lighting Industry Association/Industrial Technology Research Institute

台灣 LED 照明產業聯盟 (1 人)

- Dr Robert Yie-Zu Hu (胡耀祖)
Vice-Chairman (副理事長)

Taiwan Institute of Economic Research (TIER) 台灣經濟研究院 (2 人)

- Mr Feng-Shuo Yang (楊豐碩)
Director (所長)
Research Division V (研究五所)
- Ms Chin-Yi Huang (黃靖懿)
Assistant Research Fellow (助理研究員)
Research Division V (研究五所)

Shihlin Electric (AUS) P/L 士林電機 (2 人)

- Mario Zhang (張儀彬)
Managing Director
- Erika Lin (林家瑩)
Account Executive

Delta Energy Systems Australia Pty Ltd 台達澳洲 (1 人)

- Allen Chao (趙有為)
Director (負責人)

附件二、澳方出席會議代表團名單

澳 方 代 表 團

Chief Delegate

- Margaret Sewell
Head of Division
Department of Industry

Department of Industry (5 人)

- Ms Helen Cox
General Manager, International Branch
- Mr David de Jongh
Acting Manager - Petroleum Development & Timor Sea
- Ms Sonya Kelly
Manager
- Ms Helen Hawke
Assistant Manager
- Mr Alan McGuinness
Graduate

Department of Foreign Affairs and Trade (2 人)

- Mr Christopher Green
Hong Kong, Macau and Taiwan Section
- Mr Kevin Magee
Representative, Australian Office

Commonwealth Scientific and Industrial Research Organization (CSIRO) (2 人)

- Mr Bernard Norton
Business Development Manager
- Dr Jim Smitham

Deputy Director & Theme Leader

Austrade (3 人)

- Mr Martin Walsh
Senior Trade Commissioner
- Mr Sidney Chen
Senior Business Development Manager
- Mr Isaac Court
Trade Adviser

Australia-Taiwan Business Council (2 人)

- Mr Ross Maddock
Chairman
- Ms Ching-Mei Tuan
CEO

ARENA (1 人)

- Ms Lara Olsen
Head of Strategy

NSW Trade and Investment (2 人)

- Mr Robert Blayney
Senior Manager Industry Investment - Resources and Energy
- Mr Nicolas Van der Voort
Business Development Manager

Minerals Council of Australia (1 人)

- Mr Peter Morris
Senior Adviser - Coal

Port Waratah Coal Services (1 人)

- Mr Hennie du Plooy
Chief Executive Officer

Newcastle Institute of Energy and Resources (2 人)

- Ms Geraldine Bobsien
Research Development
- Dr Alan Broadfoot
Director

OneSteel (2 人)

- Dr Zheshi Jin
Principal Research Officer
- Mr Daniel Miles
Manager Steelmaking Solutions

Oceanlinx Limited (2 人)

- Mr Ali Baghaei
CEO
- Ms Caroline Chen
Business Development Director

MGT Resources (1 人)

- Mr Gary Kuo
Chief Operating Officer

ClarkeKann Lawyers (1 人)

- Ms Wenny Lim
Senior Associate

Goodman Lawyers (1 人)

- Mr Anthony Lin
Principal

CLEANaS (1 人)

- Mr Rhett Morson
Chairman

Resources Law Group (1 人)

- Mr Robert Pritchard
Executive Director, Energy Policy Institute of Australia

ClarkeKann Lawyers (1 人)

- Mr John Toigo
Partner

INPEX (1 人)

- Mr William Townsend
General Manager External Affairs

University of New South Wales (3 人)

- Dr Richard Corkish
Head of School
- Dr Alistair Sproul
Associate Professor
- Dr Dianne Wiley
Program Manager (CO2 Capture)

The University of Newcastle (3 人)

- Mr Rhys Palmer
Confucius Institute
- Dr Zhao Xu
Director
Center for Intelligent Electricity Networks
- Dr Behdad Moghtaderi

Head of Discipline
School of Engineering

附件三、第 19 屆台澳能能礦諮商會議議程

第 19 屆台澳能礦諮商會議議程

□ 102 年 10 月 30 日 (星期三)

會議地點：澳洲新堡皇冠假日酒店

時間	議程	備註
09:30~10:00	報到、茶敘	
09:30~09:45	團長會議	
10:00~10:20	雙方主席開幕致詞及與會人員介紹	Ms Margaret Sewell (澳洲產業部)
		歐局長嘉瑞(能源局)
議程主題一：政策發展與合作概況		
10:20~10:35	臺灣能源政策概況 臺灣對澳洲礦產與金屬之需求 (15 分鐘)	陳科長炯曉(能源局) /陳兼代副局長逸偵(礦務局)
10:35~10:50	澳洲資源與能源政策概況 (15 分鐘)	Helen Cox, 澳洲產業部
10:50~11:20	Q&A	
11:20~11:40	休息茶敘	
11:40~11:50	「第 18 屆臺澳能礦諮商會議」行動計畫執行進展之檢討及未來展望 (10 分鐘)	陳科長炯曉(能源局)
議程主題二：能礦投資與貿易之機會		
2a – 石油與天然氣		
11:50~12:05	澳洲石油及 LNG 供需，包括 2012 與 2013 年外海油氣探勘區塊礦權釋出及非傳統天然氣(15 分鐘)	David de Jongh,, 澳洲產業部
12:05~12:20	臺灣液化天然氣供需及展望 (15 分鐘)	李副執行長皇章 (臺灣中油)
12:20~12:35	澳洲 Ichthys 液化天然氣計畫 (15 分鐘)	Bill Townsend- INPEX Corporation, Australia
12:35~12:45	Q&A	
12:45~12:50	照相	
12:50~13:35	午餐	
2b – 稀土與鈾礦		
13:35~13:45	台電公司之原料鈾需求 (10 分鐘)	李副處長博仁(台電)

時間	議程	備註
13:45~13:55	澳洲稀土與鈾礦政策及產業發展（10 分鐘）	Kathy Harman, 澳洲產業部
13:55~14:05	Q&A	
2c – 煤炭與鐵礦		
14:05~14:15	台電公司煤炭需求及礦產投資（10 分鐘）	李副處長博仁(台電)
14:15~14:25	中鋼原料供需及投資概況（10 分鐘）	蕭副總欽進(中鋼)
14:25~14:35	澳洲煤炭與鐵礦供需及基礎設施（10 分鐘）	Kathy Harman, 澳洲產業部
14:35~14:50	澳洲煤炭產業之展望與機會(15 分鐘)	Peter Morris, 澳洲礦業協會
14:50~15:00	Q&A	
15:00~15:20	休息茶敘	
15:20~15:35	Port Waratah 煤炭服務概況	Hennie Du Plooy, Port Waratah Coal Services
15:35~15:50	臺灣在澳洲的商業機會	Martin Walsh, 澳洲辦事處商務處
議程主題三：潔淨能源合作		
3a – 投資機會		
15:50~16:05	臺灣再生能源推廣政策及定價機制（15 分鐘）	楊所長豐碩(台經院)
16:05~16:20	太陽能產業合作與機會（15 分鐘）	Glen Morris, 澳洲太陽能協會
16:20~16:30	Q&A	
3b – 碳捕獲與封存		
16:30~16:40	澳洲近期 CCS 發展（10 分鐘）	Prof Diane Wiley, CO2 Cooperative Research Centre
16:40~16:50	臺灣二氧化碳捕獲與封存技術進展（10 分鐘）	王副組長人謙 (工研院)
16:50~17:00	Q&A	
17:00	第一天會議結束	
17:30	搭乘接駁車至晚宴地點	
18:00~	正式晚宴 (地點：Roberts 餐廳)	

□ 102 年 10 月 31 日 (星期四)

Time	Agenda	Note
議程主題三：潔淨能源合作 Clean Energy Cooperation		
3c – 智慧電網		
09:00~09:25	智慧電網合作備忘錄進度報告 (25 分鐘)	Alan Broadfoot, NIER
09:25~09:35	Q&A	
3d – 太陽能		
09:35~09:50	次世代太陽能電池 (15 分鐘)	Igor Skryabin, ANU
09:50~10:05	臺灣太陽光電產業之優勢與合作前景 (15 分鐘)	胡副所長耀祖 (工研院)
10:05~10:10	Q&A	
3e – LED 照明		
10:10~10:20	臺灣 LED 照明產業發展現況與臺澳合作展望 (10 分鐘)	胡副所長耀祖 /副理事長 (工研院/台灣 LED 照 明產業聯盟)
10:20~10:30	零耗能建築 (10 分鐘)	Alastair Sproul, 新南威爾斯大學/低碳 生活合作研究中心
10:30~10:35	Q&A	
10:35~10:55	休息茶敘	
3f – 生質燃料		
10:55~11:05	創新低碳損生質丁醇技術 (10 分鐘)	王副組長人謙 (工研院)
11:05~11:15	澳洲生質燃料研究概況及產業發展 (10 分鐘)	Lara Olsen, 澳洲再生能源署
11:15~11:20	Q&A	
3g – 能源效率		
11:20~11:35	太陽能製冷、微型電網、聚光型太陽能發電、廢棄物轉換能源 (15 分鐘)	Jim Smitham, CSIRO
11:35~11:50	臺灣 ORC 熱電轉換能力 (15 分鐘)	王副組長人謙 (工研院)

Time	Agenda	Note
11:50~12:00	Q&A	
議程主題四：未來合作策略		
12:00~12:20	2013-2014 工作計畫 (20 分鐘)	Helen Cox, 澳洲產業部
12:30~12:35	臺灣及澳洲代表團團長閉幕總結 簽署會議紀錄同意書及工作計畫更新版 (團長交換禮品及照相)	
12:35	會議結束	
13:00	臺方答謝午宴	

參訪行程

□ 102 年 11 月 1 日 (星期五)

行程表	
09:00	自皇冠假日酒店出發
09:15~10:45	澳洲聯邦科學與工業研究組織太陽能發展中心-研究領域包括太陽能發電、太陽能製冷、微型電網、能源效率、電動車及智慧電網。
11:00~12:45	澳洲新堡能礦資源研究所-參觀新實驗室等設施。茶敘
13:00~14:00	Hunter 溼地保育中心-參觀溼地及澳洲當地動物。午餐。
14:00~15:30	Waratah 港口 Kooragang 運煤碼頭
15:30~15:50	前往新堡機場返國

**19th Australia-Taiwan Joint Energy and Minerals, Trade and Investment
Cooperation Consultations**

Date : 30 October – 1 November 2013

**Venue : Crowne Plaza Hotel, Corner of Merewether St & Wharf Rd,
Newcastle, Australia**

Day 1 – Wednesday, 30 October 2013		
Time	Agenda	Note
09:30~10:00	Registration, Tea and Coffee	
09:30~09:45	Heads of Delegation Meeting	
10:00~10:20	Opening remarks and introduction of delegation	Ms Margaret Sewell, Department of Industry
		Dr Jia-Ruey Ou, BOE
Session 1: Overview of National Policy Developments and Collaboration		
10:20~10:35	Taiwan's Energy Policy	Dr Jyuung-Shiauu Chern, BOE
	Taiwan's Demand for Australian Minerals and Metals(15 mins)	/ Mr Yet-Jen Chen, BOM
10:35~10:50	Australia's Resources and Energy Policy Overview (15 mins)	Helen Cox, Department of Industry
10:50~11:20	Q&A	
11:20~11:40	Morning Tea	
11:40~11:50	The Bilateral Cooperation Action Plan of the 18th Meeting of Taiwan /Australia Joint Energy and Minerals Trade, Investment and Cooperation Consultations- Summary of the Bilateral Cooperation Outcomes - Review and Outlook (10 mins)	Dr Jyuung-Shiauu Chern, BOE
Session 2: Investment and Trade Opportunities in Resources and Energy		
2a –Petroleum and Gas		
11:50~12:05	Australia's Petroleum and LNG Supply and Demand, including the 2012/2013 Offshore Acreage Release and Unconventional Gas (15 mins)	David de Jongh, Department of Industry
12:05~12:20	Taiwan's LNG Demand & Supply and Outlook (15 mins)	Mr Huang-Chang Lee, CPC Corporation, Taiwan

Day 1 – Wednesday, 30 October 2013		
Time	Agenda	Note
12:20~12:35	“The Big, Bold and Beautiful Ichthys LNG Project” (15 mins)	Bill Townsend- INPEX Corporation, Australia
12:35~12:45	Q&A	
12:45~12:50	Official Group Photo	
12:50~13:35	Lunch	
2b – Rare Earths and Uranium		
13:35~13:45	Taipower’s Uranium Demand (10 mins)	Mr Po-Jen Lee, TPC
13:45~13:55	Australia’s Rare Earths and Uranium Policy and Industry Developments (10 mins)	Kathy Harman, Department of Industry
13:55~14:05	Q&A	
2c – Coal and Iron Ore		
14:05~14:15	Taipower’s Coal Demand & Mine Investment (10 mins)	Mr Po-Jen Lee, TPC
14:15~14:25	Raw Materials Procurement and Investment of China Steel Group in Australia (10 mins)	Mr Chine-Jine Hsiao, CPC
14:25~14:35	Australia’s Coal and Iron Ore Supply, Demand and Infrastructure (10 mins)	Kathy Harman, Department of Industry
14:35~14:50	Coal Industry Outlook and Opportunities in Australia (15 mins)	Peter Morris, Minerals Council of Australia
14:50~15:00	Q&A	
15:00~15:20	Afternoon Tea	
15:20~15:35	Port Waratah Coal Services (15 mins)	Hennie Du Plooy, Port Waratah Coal Services
15:35~15:50	Opportunities for Taiwan Business in Australia (15 mins)	Martin Walsh, Austrade
Session 3: Clean Energy Cooperation		
3a – Investment Opportunities		
15:50~16:05	Renewable Energy Promotion Policies and Pricing Mechanism in Taiwan (15 mins)	Mr Feng-Shuo Yang, TIER
16:05~16:20	Solar Industry Collaboration and Opportunities (15 mins)	Glen Morris, Australia Solar Council
16:20~16:30	Q&A	
3b – Carbon Capture and Storage		
16:30~16:40	Recent CCS Development in Australia (10 mins)	Prof Diane Wiley, CO2 Cooperative Research

Day 1 – Wednesday, 30 October 2013		
Time	Agenda	Note
		Centre
16:40~16:50	CCS Efforts and Status in Taiwan (10 mins)	Dr Ren-Chain Wang, ITRI
16:50~17:00	Q&A	
17:00	CLOSE OF DAY 1	
17:30	Bus departs for official dinner	
18:15	Official JEMTIC Dinner (Hosted by Australia) Venue : Roberts Restaurant	

Day 2 – Thursday, 31 October 2013		
Time	Agenda	Note
Session 3: Clean Energy Cooperation (continued)		
3c – Smart Grids		
09:00~09:25	Status Report on Memorandum of Agreement – Smart Grids (25 mins)	Alan Broadfoot, Newcastle Institute for Energy and Resources
09:25~09:35	Q&A	
3d – Solar Energy		
09:35~09:50	Next Generation Solar Cells (15 mins)	Igor Skryabin, Australian National University
09:50~10:05	Strength of Taiwan’s PV Industry and Collaboration Perspectives (15 mins)	Dr Robert Yie-Zu Hu, ITRI
10:05~10:10	Q&A	
3e – LED lighting		
10:10~10:20	Current Status of Taiwan’s LED Industry and Future Cooperation between Taiwan & Australia (10 mins)	Dr Robert Yie-Zu Hu, ITRI/ Taiwan LED Lighting Industry Association
10:20~10:30	Zero Energy Buildings (10 mins)	Alastair Sproul, University of New South Wales/ Cooperative Research Centre for Low Carbon Living
10:30~10:35	Q&A	
10:35~10:55	Morning Tea	
3f – Biofuels		
10:55~11:05	Innovative Low Carbon Loss Bio-Butanol Technology (10 mins)	Dr Ren-Chain Wang, ITRI
11:05~11:15	Overview of Australia’s Biofuels Research and Industry Developments (10 mins)	Lara Olsen, Australian Renewable Energy Agency
11:15~11:20	Q&A	

Day 2 – Thursday, 31 October 2013		
Time	Agenda	Note
3g – Energy Efficiency		
11:20~11:35	Solar Cooling, Mini-grids, Concentrating Solar Power, Waste to Energy (15 mins)	Jim Smitham, Commonwealth Scientific and Industrial Research Organisation
11:35~11:50	Taiwan's Capability in Organic Ranking Cycle Heat to Power Conversion (15 mins)	Dr Ren-Chain Wang, ITRI
11:50~12:00	Q&A	
Session 4: Future Collaboration Strategy		
12:00~12:20	Finalisation of 2013-2014 Work Plan (20 mins)	Helen Cox, Department of Industry
12:20~12:35	Closing remarks of Taiwanese and Australian Heads of Delegation Signing of Agreed Record of Meeting and Updated Work Plan (Exchange of gifts by Heads of Delegation and photographs)	
12:35	Meeting Close	
13:00	Lunch (hosted by Taiwan)	

Site Visits – Friday, 1 November 2013	
Draft Timetable	
09:00	Depart Crowne Plaza Hotel
09:15~10:45	CSIRO Solar Energy Centre – Concentrating solar power, solar cooling, minigrid/microgrids, energy efficiency, electric cars and smart grids
11:00~12:45	Newcastle Institute for Energy and Resources - Morning Tea followed by tour of facilities, including new labs.
13:00~14:00	Hunter wetlands centre – eco wetlands and Australian native animals. Guided tour and barbecue lunch
14:00~15:30	Port Waratah coal handling facility
15:30~15:50	Travel to Newcastle airport. Drop-off for Canberra/Brisbane flights.
16:00~16:30	Depart airport for Crowne Plaza Hotel, Newcastle