www.ebao.us

e報導

九月號 2006

<Asian Lifestyle>

eBao News Magazine

風電先驅

鮑亦和院士的立軸式浮海風力發電機

Dr. Michael Pao

專訪鮑亦和院士

P. 8

Interview with Dr. Yih-Ho Michael Pao
A Windpower Pioneer, New Invention on Floating Wind Turbines

Floating-Vertical-Axis-Wind-Turbine™

高永寧夫婦點石成金的故事
Success Story of Mandy and William P. 22

為什麼要購買產權保險？
Title insurance helps protect your real estate investment P. 28

Realm of Renewable Energy
能源大改變

自從愛迪生發明電燈以來，電力帶來的方便，主宰了人類世紀以來的生活，迄今能源耗盡，找尋新的能源替代成為科學家們全力以赴的目標。

環保和能源相結合是當今人們必須兼顧的責任，傳統的能源供應已不足也不切所需，大自然存在的風力，成為科學家研究產生發電的最佳來源。

２０多年前就研究開始風力發電的美國國家工程院士鮑亦和博士，多年來從不停止對這個議題的探討，現在他對此有更新的研發成果，他改變傳統風扇葉片，深入近海海域，研究出更價廉物美的綠色能源。以風代煤，以電代油的時代即將實現。

最佳拍擋，本期介紹善於經營地產的年輕夫婦，高永寧和吳敏儀，他們點石成金的功力值得有心人學習。

Thomas Edison, the inventor the electric light bulb -- helped change everyone's life.

Electricity is a basic part of nature and it is one of our most widely used forms of energy. With the depletion of conventional resources drawing near, many scientists are accelerating their gear to explore alternative resources.

Dr. Pao from the U.S. National Academy of Engineering has begun his research on wind power more than twenty years ago. Today, he has achieved one of the important breakthroughs in green energy by inventing floating wind farms at sea.

In this issue, a perfect husband and wife team, Mandy and William Kao shared with us their secret to success in business.

總編輯 鄔逸卉
Lotus Wu

發行人：陳建中 James Chen
資深顧問：徐潤 William Hsu
總編輯：鄔逸卉 Lotus Wu
諮詢顧問(Advisory Board):
王敦正・李雄・賴清陽
美術設計：陳世星Cissy Chen
文字記者：陳盈卉VarenceTan

發行所：全方位資訊公司
電話：(713)484-8181
傳真：(713)574-6901
網站：www.ebao.us
電郵：editor@ebao.us
地址：7001 Corporate Dr.#208
Houston, TX 77036

【免費贈閱月刊 FREE 】外地郵寄每年30美元 ISSN 1554-253X

e報導雜誌是一本園地公開的刊物，歡迎讀者與我們做雙向交流。本雜誌提供專欄作者電子郵件信箱，讀者可以來函與作者互動；也可在ebao.us網站發表意見，在網站上“關於e報”的欄目設有“意見箱”，備有讀者投書表，或者參與“社群討論區”分享心得，讀者們有任何關於電子報或e報導雜誌的建議，都歡迎發表看法，我們會公開在網站上。
對地產或投資理財有關問題，也歡迎來函詢問，我們會請專家作答，解決您的問題。

風電先驅，鮑亦和院士的浮海風力發電機

文/徐潤
e報特約專欄作家

他是創新思想家
他是科技發明家
他是美國國家工程院院士
他被法國工業科技期刊評為過去40年 全世界最重要100位的創新者之一
他被稱為 “水刀之父”
他的公司曾獲得美國能源部全國能源創新最高獎
他是浮海風力發電場的創始人
他是成功技術企業家。 在美國，他曾有三家上市的技術公司
他為人類發展了新的工具和能源。

學者從商之先河

每次和鮑亦和院士(Dr. Y. H. Michael Pao) 見面，他總是在切入正題後，走到會議桌頂端的寫字板前，揮舞手中的彩筆，畫出各種符號，寫出各種數字，而且多數在小數點以後。此景此情，像時光倒退了幾十年，筆者在大學的階梯教室裡，尊敬的師長在講臺上，娓娓道來，把他的學子帶入變幻無窮的科學殿堂。

眼前的鮑院士正是這樣，雖已進入從心所欲，不逾矩之年，說起話來仍然底氣十足，走起路來步履輕盈，精神矍爍。一頭梳理整齊的灰髮，和絕對平整的襯衫領帶，且色彩配搭相宜，襯出他紅潤的面色和一派儒雅之風。大科學家特有的高額充滿了智睿，充滿了人生的閱歷和經驗。看他在講臺上，胸中有丘壑，腕底生疾風，竟有玉樹臨風飄逸。一派天然，在率真質樸之中，構成精神世界和科學世界的交融。

美國國家工程院 (National Academy of Engineering USA) 是全世界工程科學的最高殿堂，院士們都是全世界範圍中遴選而出，每位都是真才實學，有重大發明。美國國家工程院有兩千多位院士，

鮑院士是21世紀初年，即2000年當選為院士的，少數裔僅僅是2位數，華裔則更少。實在使人驚奇的是，鮑院士的胞兄鮑亦興博士也是美國國家工程院的院士。他是世界應用力學界的權威人士。這樣的例子真是天下慕向之，如鳳毛麟角。且又使人不禁想起他們的祖德，鮑院士的祖父是江蘇東臺人，清末最後的秀才，在那窮鄉僻壤有如此讀書君子是何等榮耀。鮑院士的父親鮑德澄不到20歲，就離開故裡，去香港讀書。是他，第一個把歐洲土地改革法翻譯成中文，官拜地政部次長，台灣的土地改革為台灣的經濟騰飛奠定了基礎，鮑老先生功不可沒。鮑氏兄弟的傑出成功除了祖德外，當然他們自己的努力是毋庸置疑的。

上世紀六十年代初，鮑亦和自約翰．霍普金斯大學（Johns Hopkins University）取得博士學位，進入西雅圖波音科學研究所工作，專攻大氣中的層流（flows in stratified atmosphere），並編訂“高空的紊流及其探測“ 一書， 於1968 年出版。（“Clear Air Turbulence and Its Detection,” Edited by Yih-Ho Pao and A. Goldberg, Plenum Press, 1968). 八年的時間，他並參與波音公司的許多發展計劃，包括：波音727、 737、及747客機的發展。用雷達（phased-arrayed radar）偵察洲際導彈等。不僅是科學研究，還有怎樣把高新科技應用在商業領域，怎樣組織團隊，培養人才，怎樣應對客戶，建立良好人際關係．．． 鮑院士回顧說，在波音公司的八年，除研究發展外，還學了很多其他的項目，也為他後來的創業及發展奠定了很好的基礎。他也很感謝波音公司。

豐富想像力，創造新科技

現任美國國務卿萊斯(Condoleezza Rice) 在2005年2月18日美國參議院 發表演說時說，只有讓人民有 〝想像力〞(Imagination)，國家才有發展空間，人民有了想像力，國家就有希望。資本市場的最大活力，要的就是〝想像力〞，而不是〝現金股息〞投資的吹捧。

有了想像力，才會創新，科技創新也是一樣。鮑亦和院士確實是科技創新方面的思想家，從而才能成為傑出的科技發明家。1998年，鮑院士被法國工業科技期刊 （Industries et Technique）評為過去40年(1958-1998) 全世界100位最重要的創新者之一。

1971年，鮑院士離開波音公司，僅投入2000美元，用家中的車庫作辦公室，開始了自行創業。僅僅4個月，就拿到第一份美國海軍的研究發展合約。他把在波音研究的專長，運用到深海探測，為美國海軍推測大型潛水艇在海底的蹤跡。

以後，他又領導發展了水箭技術和水平導向鑽孔技術。把超高壓的水箭(Ultrahigh-Pressure Waterjet) 發展成 一個新的工具。是工業上，以電腦操縱，冷切、冷割、冷鑽、冷銑的新工具。成為 可變通性工廠自動化（flexible factory automation）的主要工具。創立了新的水刀工業 (Waterjet Machining Industry)。 鮑院士被稱為“水刀之父”。水平導向鑽孔技術（horizontal directional drilling)，是把導向的高壓水鑽發展成一個在地面下鑽孔的新工具。用不挖溝的方式來安裝各種地下管道。不要挖溝破壞地面。引進了一個新的”不挖溝”工業。 這些新技術很快轉成商業化。公司先後在美國NASDAQ全國市場上市。

鮑院士在美國創立了六家技術公司，並擔任他們的董事長及總裁，發展他們的技術和管理團隊。把三家公司在美國NASDAQ全國市場上市。這三家公司是: Flow International Corporation (FLOW), ADMAC, Inc. (ADMC) 和FlowMole Corporation (MOLE)。依照Baron’s 的統計，FLOW是在1983年全美國新上市公司中股票上漲最高的第三名。

因為嚴重的過敏症，1992年，鮑院士舉家南遷，從美國最北部的西雅圖到最南部的休士頓。1999年，鮑院士的過敏症越來越嚴重，再加上血管堵塞，健康每況愈下。宣告退休，賣掉他上市公司的股份，進入病退狀態。鮑院士改變飲食及生活方式，老天有眼，奇蹟出現，竟以自我調整，戰勝疾病。

東山再起，一年前，鮑院士開始領導發展浮在海上的風力發電場。在風大的海上，裝置大批、便宜可靠、立軸式、浮在海上的風電機。把海上豐富的風能資源，變成便宜的綠電。

時勢造英雄，這是古今中外的歷史所證實的。如今的時勢，將造就鮑院士這位老英雄。

2000年諾貝爾化學獎得主、現致力於研究新能源的科學家麥克德邁(Alan G. MacDiarmid) 今年8月在全美新興資訊科技大會 (EITC) 上報告說，〝在未來50年，人類面對的10大挑戰中的第一名就是能源，其次是水源、糧食、環境、貧窮、恐怖戰爭、病疫、教育、民主、人口。在能源的解決辦法上有風能、日光能、地熱、海流、核能、氫能、生物能。〞他將能源作為未來50年人類面對10大挑戰的第一，又將風能作為解決能源的首位。按照邏輯學，我們能不能這樣說，風能是未來50年人類要解決的最主要的問題。

筆者特訪鮑院士，因為聽說，他正在醞釀著，戰略性的大戰役，如果成功，將改變能源發展的歷史；如果成功，將給全球人類帶來福音。也就是前面麥氏報道中的兩個第一，能源是第一挑戰，風能是第一解決方法。鮑院士的大戰役就是他正在制定的**〝以風代煤，以風代油〞**的五年戰略計劃，投入31億美元，在風大的海上發展一座大規模的浮海風電場，使海上風電比煤電便宜。如此，海風可取代煤，成為發電的主要能源。便宜的綠電，可取代汽油，成為推動油電混合車輛的主要能源。以風代煤，以風代油，可大大減少世界上能源缺乏，空氣污染，及氣溫上升的問題。

早在上世紀80年代，鮑院士對風力發電產生了興趣，並著手開發。於1981年成立福祿風電公司 （FloWind Corporation），並擔任其總裁 (1981-1985)。在他的領導下，福祿風電公司和美國三地亞國家研究所 Sandia National labs合作，共同發展出，經久耐用、造價低廉，300千瓦立軸式風力發電機（為當時水平軸式發電機造價的40%）。這是當時美國最先進，功率最大，發電成本最低的風力發電機。並與”三地亞”共同榮獲得1984年美國能源部全國能源創新的最高獎。

研究風力發電20餘年

1981到1985年底，鮑院士在加州舊金山附近的Altamont Pass 和洛杉磯附近的Tehachapi

Mountains創建了兩個大規模風力發電場，總裝機量17萬千瓦。他領導的福祿風電公司成為全美國第二大風電公司。福祿風電公司曾設計、製造、安裝了500多臺100千瓦及300千瓦立軸式風力發電機。這些造價低、高質量的風力發電機在加州運營了20多年。鮑院士不愧為華人發展大型風力發電機及大規模風力發電場的先驅。

近年來，以石油為主的能源危機紛紛亂亂，上牽動著各國領導人的神經，下關切到平民百姓的生計，無人不受其影響，各種聲音應運而生。

作為一位有責任感的學者，他要大力發展風力發電，把他的立軸式發電機搬到海上去。

從去年開始，他的每一根血管都為此而流動，他的每一根神經都為之而跳動，他已全身心地進入了這一境界。

休士頓是世界能源之都，也是海上技術的大本營，海上石油平臺林立。於是，他找來了海上平臺專家，要讓立軸式發電機，可穩定的浮在海上。

新的立軸式浮海風力發電機必須要用新的材料，即要質量好，又要價格低。於是，他又找來了美國高新合成材料的專家，汪蘇甦博士（麻省理工MIT）。汪博士是休士頓大學的名教授，也是合成材料在海上的應用中心的主任。最近又被任命為美國外海大型風機測驗中心的主任。

白先慎博士，蘇博士，張執信博士，田撝博士・・・也參加了鮑院士新的團隊。團隊的作用，怎樣組織團隊，鮑院士絕對不會次與企業巨頭。他在西雅圖的團隊曾經擁有40多名博士。三家公司上市

後，很多位團隊成員，成了百萬富翁。

休士頓是美國第四大城市，是最大的世界能源、航天、醫學、海洋科學中心。最近，聯邦政府決心把美國海上風能中心放在休士頓，並列入北極星計劃。北極星計劃是美國在德州施行的一個龐大的經濟計劃，將投資600億美元，像北極星那樣，引導美國的經濟發展。

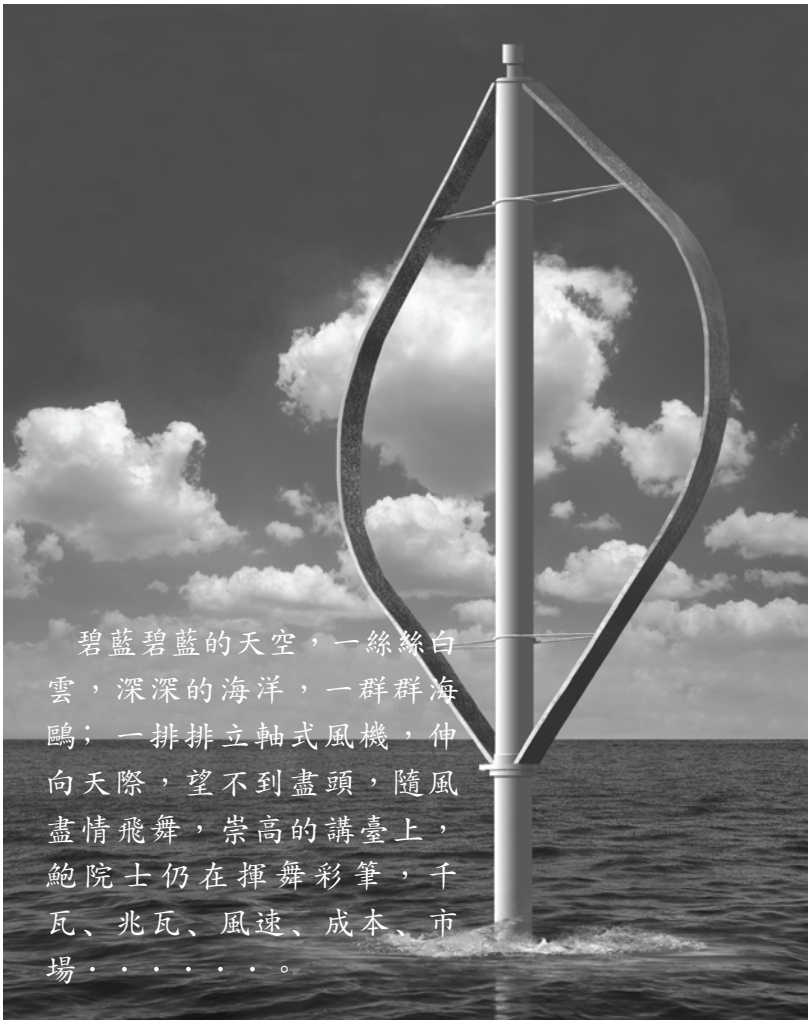
從2005年初到2006四月底，16個月中，鮑院士飛行了20多萬英哩。足跡踏遍大半個地球。去了解世界上電能的需求及供應和風電的發展。尤其是了解風電領先的歐洲，包括：它在風電技術上的發展、風電場的投資和貸款、及海上風電場的發展計劃。及歐洲各國的風電優惠政策。並進一步了解中國大陸及台灣的風電政策及其沿海風速分布圖。他為**"以風代煤，以風代油"**的戰略計劃，收集了很多資料。

絕大多數人，到了鮑院士這樣的年紀都有『風雨歸舟』之感：卸職入深山，隱雲峰，受享清閑。鮑院士原本完全可以功成名就，頤養天年，以他對人類的貢獻，到任何時候都會得到社會的崇敬。有人說，〝人到了老年，有5老 — 老本(身體) 、老底(經濟) 、老伴、老友(好朋友) 、老窩(住所) ，如果這5老基本保證，晚年的生活就會很幸福了。〞鮑院士對此一一不缺，遠遠超過了這5老。他有一個幸福的家庭，夫人賢惠時尚，育有一兒一女，女兒鮑世芳哈佛大學商學院碩士，兒子鮑世民麻省理工學院電機工程，電腦科學碩士，他們各人頭上都有一片天，拒過〝少以父蔭〞的日子，獨自立業。是什麼驅使鮑院士在此高齡又要披甲上陣? 因為他有一顆赤子之心。

鮑院士是位美籍華人，像很多老華僑那樣，池魚思

故淵。去年3月，他回到故鄉，江蘇東台，於東台市政府簽約，在風大的東台海岸上及海上，建立大規模的風力發電場，為長江三角洲生產大量的綠電，並提高鄉親的生活水平。現在，鮑院士又忘情地和我探討，將他那宏偉計劃的突破口放到中國去，在中國沿海風大的海上，或在風大的台灣海峽上，矗立起他的大規模的浮海風電場。他說，再生能源是一個層面，減少中國的空氣污染，保護好環境又是一個層面。凝視著老人，我默默地背誦著一位哲人給我的信中所引用的八世紀的佛教老師善地德瓦 (Shantideva) 的話:

世界上一切的喜悅，
來自希望他人快樂。
世界上一切的痛苦，
來自希望自己享受。
需要很繁瑣的解釋嗎?
幼稚的眾生只管自己，
佛則為他人福祉而操勞，
看看這兩者差別有多大！



碧藍碧藍的天空，一絲絲白雲，深深的海洋，一群群海鷗；一排排立軸式風機，伸向天際，望不到盡頭，隨風盡情飛舞，崇高的講臺上，鮑院士仍在揮舞彩筆，千瓦、兆瓦、風速、成本、市場。。。。。。。

附錄：

他為人類發展了新的工具和能源。

在他的領導下：

1. 水箭技術 (Waterjet Technology)。把超高壓的水箭 (Ultrahigh-Pressure Waterjet) 發展成一個新的工具。是工業上，以電腦操縱，冷切、冷割、冷鑽、冷銑的新工具。成為可變通性工廠自動化 (flexible factory automation) 的主要工具。創立了新的水刀工業 (Waterjet Machining Industry). 被稱為“水刀之父”.

2. 不挖溝技術 (Trenchless Technology)。把水鑽 (Rotating Waterjets) 發展成一 個新的工具。用在地下水平導向鑽孔 (Directional Horizontal Drilling)。以不挖 溝、很便宜的方式安裝地下管道。 不破壞地面。 引進了不挖溝的新工業 (Trenchless Industry)

3. 立軸式風電機技術 (Vertical Axis Wind Turbine Technology)。 和美國三地亞國家研究所 (Sandia National Labs)合作把立軸式風電機發展成一個便宜可靠，在陸上風力發電的工具。生產清潔的電源。為社會的清潔電源及環境保護作貢獻。他的福祿風電公司和三地亞共同獲得美國能源部1981年度全國能源創新 的最高獎 。

4. 表面處理技術(Surface Preparation Technology)。 發展沙水箭 (NewjetTM) 成 一個除鏽除漆效率很高的新工具。取代噴沙。無灰塵，不生火花。 很經濟，很衛生，也很安全。US Patent No. 6,168,503 (2001). 現由一家德國公司商業化。在船塢中，為船舶除漆除鏽，取代噴沙。

5. 浮海風電場 (Floating-Windfarms-at-SeaTM)。正在發展大規模、浮在海上的風力發電場。在風大的海上，裝置大批、便宜可靠、立軸式、浮在海上的風電機。浮海風電場可成為一個新的工具，把海上豐富的風能資源，變成便宜的綠電。如此，風可取代煤，成為發電的主要能源。便宜的綠電，可取代汽油，成為推動油電混合車輛的主要能源。**以風代煤，以風代油**，可大大減少世界上能源缺乏，空氣污染及氣溫上升的問題。

Interview with Dr. Yih-Ho Michael Pao

A Windpower Pioneer, New Invention on Floating Wind Turbines

By James Chen, Editor-in-Chief

He is a creative thinker
He is a technology innovator
He was called the "Father of Waternife™ "
He was elected a Member of National Academy of Engineering USA in 2000
He has created 3 new industries: waterjet machining industry; trenchless industry; and waterjet surface treatment industry
He was cited by a leading French industrial technology journal in 1998 as one of 100 important innovators for the past 40 years
His company received the Top National Award for Energy Innovation from the US Dept of Energy
He created the concept of Floating-Windfarms-at-Sea™
He is a successful entrepreneur – formed 6 technology-based companies, and taken 3 of them public
He is a successful industrialist – served as the CEOs of 3 public companies, listed on NASDAQ national market.

He has developed better tools and energy sources for the society, by developing and commercializing new technologies:

1. Waterjet Technology – developed the ultrahigh-pressure waterjets and abrasive-waterjets into *better tools* for industrial cutting, drilling, and milling, especially for flexible factory automation; and created the new *waterjet machining industry* and *waterjet surface treatment industry*.

2. Trenchless Technology – developed the guided, rotating, high-pressure mud-jets into *better tools* for horizontal directional drilling for the low-cost, trenchless installation of underground cables and pipes with minimal surface disruption; and ushered in the modern *trenchless industry*.

3. Vertical Axis Wind Turbine Technology – developed, jointly with Sandia National Labs, the low-cost vertical axis wind turbines into *better tools* for converting wind over land to *'green' electricity*. His company, FloWind, joint with Sandia, received the *top national award for energy innovation* for 1984, from the U. S. Dept of Energy.

4. Advanced Wet-Blasting Technology – developed the advanced wet-blasting technology into a *better tool* for surface preparation, without generating airborne dust or hot sparks – replace the hazardous grid blasting.

■ He has come out of retirement; and formed ecoPower to develop a *powerful new tool* for the society:

5. Floating-Windfarm-at-Sea™ – to develop the

Floating-Windfarm-at-Sea™ into a *better tool* for converting the rich wind energy resources at sea to *low-cost 'green' electricity*.

Developing Better Tools and Energy Sources for the Society

Over the past 30 years, Dr. Y H Michael Pao has developed *better tools and energy sources* for the society (see the summary above); and created *three new industries* – *waterjet machining industry*; *trenchless industry*; and *waterjet surface treatment industry*. In the process, he has formed six technology-based companies in the US, served as their CEOs, and listed three of them on NASDAQ National Market. One of them, FLOW International, when it went public in 1983, was the 3rd best performing IPO for that year, according to Barron's.

Dr. Pao has come out of retirement, and formed ecoPower to develop a *powerful new tool* for the society

To develop the Floating-Windfarm-at-Sea™ into a better tool for converting the rich wind energy resources at sea to *low-cost 'green' electricity*.

Formative Years at the Boeing Company

Dr. Pao received his doctor of engineering degree in fluid mechanics from The Johns Hopkins

University in 1962. After graduation, he joined the Boeing Scientific Research Lab (BSRL) as a research scientist in Seattle, WA – it was a newly formed basic research lab of the Boeing Company. At BSRL, he carried out basic research for flows in stratified media, especially for internal waves and turbulence in stratified media, such as in the upper atmosphere and deeper ocean. He also served as a consultant to many Boeing projects, including: the development of Boeing 727, 737, 747, and SST; the detection of clear air turbulence; and the detection of intercontinental ballistic missiles through their hot turbulent re-entry wakes, using phased-array radars. At Boeing, he learned not only how to carry out world-class research work, but also how to apply technologies to commercial applications – and the importance of making technology user-friendly and cost-effective! More importantly, at Boeing, he developed his inter-personal skills, his public speaking capability, and his management know-how. These laid the firm foundation for his business ventures later on. Dr. Pao said, looking back, these 8 years at Boeing were his most important formative years! Dr. Pao deeply appreciates the opportunities that the Boeing Company had given him.

Entrepreneur Years – formed 6 Technology-Based Companies, and took 3 of them public

Dr Pao left the Boeing Company in 1970, and formed his first company, Flow Industries, Inc., in the garage of his Seattle home, with a personal investment of $2,000. Flow Industries obtained his first research contract from the U.S. Navy – to study the hydrodynamic signatures of strategic nuclear submarines in the stratified deep ocean – a highly classified subject of the U.S. Navy. Flow Industries, formed at the height of the Cold War, was mainly a contract research firm for the US Defense Dept and NASA, and became a leading contract research firm for flow research. At one time, it employed more than 40 Ph.Ds, and engaged professors from leading universities as consultants, such as Caltech, MIT, Harvard, Princeton, UCLA, etc. With the help of Flow Industries as the think tank, Dr. Pao developed six-technology based companies, and served as their CEOs:

1. Flow International Corporation, which developed ultrahigh-pressure waterjets and abrasive-waterjets as better tools for industrial cutting, drilling, and milling. Computer-controlled waterjets and abrasive-waterjets have become major cutting and drilling tools for flexible factory automation. It created the *waterjet machining industry*. The company is listed on NASDAQ National Market (NASDAQ Symbol: FLOW). When it went public in 1983, it was the 3rd best performing IPO for that year, according to Barron's. (Waterjet video on

"Waterjet: A Modern Tool for Cutting, Drilling, and Milling," which was broadcasted nationwide on July 20, 2001, by FOX Cable News in its Champion of Industry Program see www.ebao.us/media for Fox news video)

2. ADMAC, Inc., which developed ultrahigh-pressure rotating waterjets as better tools for surface treatment, including: the removal of old coating and rust from steel surfaces (of ships, vehicles, steel equipment and structures) for re-coating; and the removal of delaminated concrete from concrete structures for repairs (including concrete bridges and parking garages). It created the waterjet *surface treatment industry*, using ultrahigh-pressure rotating waterjets. The company went public in 1985; and was listed on NASDAQ National Market (ADMC). It was merged into FLOW in 1989.

3. FloWind Corporation, which developed, jointly with Sandia National Labs, the vertical axis wind turbines (VAWTs) as low-cost tools for converting wind over land to *'green' electricity*, and received jointly with Sandia, the *top national award for energy innovation* for 1984, from the US Dept of Energy. (see www.ebao.us/media for a FloWind video)

4. FlowMole Corporation, which developed the guided, rotating, high-pressure mud-jets as *better tools* for horizontal directional drilling for the installation of underground cables and pipes with minimal surface disruption and at low costs. It ushered in the modern *trenchless industry*. The company went public in 1988; and was listed on NASDAQ National Market (MOLE). It was acquired in 2000.

5. Waterjet International, Inc., which developed the advanced wet-blasting technology into a *better tool* for surface preparation (Newjet ™, US patent No. 6,181,503, Jan 2, 2001). Newjet ™ removes old coating

and rust from surfaces effectively, without creating airborne dust or hot sparks – *replacing the hazardous grit blasting*. Newjet ™ is being commercialized by a German company, Mühlhan Surface Protection GmbH, in shipyards for removing old coatings and rust from ships for recoating.

6. FlowDril Corporation, which developed a new oil & gas drilling technology, using ultrahigh-pressure waterjets to pre-cut and weaken the rock for the drill-bit, and, thus, greatly increase the drilling rate, especially for drilling deep oil & gas wells through hard formations. This technology has not yet been commercialized.

A Windpower Pioneer

Dr. Pao was an early pioneer in developing large wind turbines. He is the founder of FloWind Corporation, and served as its CEO from 1981 to 1985. He led the efforts at FloWind that developed the 100 kW and 300 kW vertical axis wind turbines (VAWTs), jointly with Sandia National Lab. The 300 kW VAWT was the largest and most cost-effective wind turbine at that time. For their contributions, FloWind and Sandia jointly received the top national award for energy innovation for 1984, from the U. S. Dept of Energy.

He was also an early pioneer in developing large-scale windfarms. He led the efforts at FloWind that designed, manufactured, installed, and operated 500 of these VAWTs over 7,000 acres of high-wind properties in two windfarms in California – one in the Altamont Pass near San Francisco and one in the Tehachapi Pass near Los Angeles, for a total power output of 170 MW (including those from Danish wind turbines). By the end of 1985, FloWind became the second largest windpower company in the world. These low-cost VAWTs operated reliably in California for over 20 years. (See www.ebao.us/media for a FloWind video)

In 1986, the oil price dropped to $10 per barrel, and

the electricity price in California was lowered from 9 cents to 4 cents per kWh, which was way below FloWind's cost of 7.5 cents per kWh. Subsequently, Dr. Pao had to sell his ownership in FloWind.

Returning to Windpower Industry

Dr. Pao was very ill, and retired in 1999, at the age of 65. In 2001, he learned to change his life style and diet (to Zone diet), and began to regain his health.

In late 2001, he began to explore windpower opportunities in China. He was invited to attend an 'Inner Mongolia Investment and Development Conference' in Baotou, Inner Mongolia, China, Sept 18-19, 2001, and gave a keynote speech at the Conference on "Developing the Rich Wind Energy Resources of Inner Mongolia." Subsequently, he organized Enhancement Partners LP to explore the feasibility of developing large-scale windfarms there, jointly with an investment company of Inner Mongolia (sponsored by the government of Inner Mongolia). But, it was too early for China, where the power grid company insisted on negotiating its power purchase contract on a year-to-year basis, which made it very difficult to obtain any long-term project financing for new windfarms in Inner Mongolia.

Since 2003, Dr. Pao's health has been further improved by taking high-dose fish oil daily.

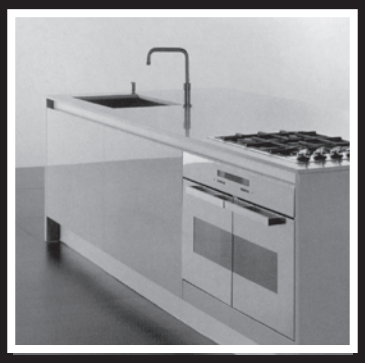
In June 2004, Dr. Pao was invited to present his views on "Entrepreneurships in China" at the Harvard Business School "Global Leadership Forum" in Shanghai, China. At the Forum, Dr. Pao learned from several Chinese government officials that China was in the process of establishing a new "Renewable Energy Law" to encourage the investment and development of renewable energy in China; and he read a draft copy of the Law in Chinese. After returning from Shanghai, Dr. Pao formed ecoPower in Houston in July 2004, and, once again, to explore windpower opportunities in China. Seven months later, on Feb 28, 2005, China's National People's Congress passed the Renewable Energy Law, to become effective on Jan 1, 2006.

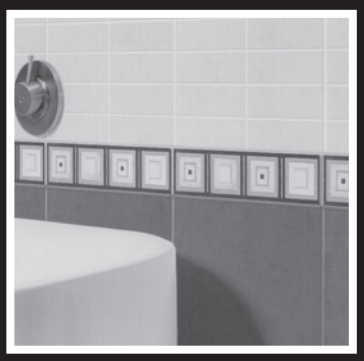
On Mar 3, 2005, ecoPower signed an agreement with the Municipal Government of Dongtai, China to develop large-scale windfarms there, on land and offshore, up to 3,000 MW. Dongtai is located on the windy shores of the Yellow Sea, about 120 miles north of Shanghai. The measured mean wind velocity on the shore of Dongtai is 7.1 meters per second, at the height of 70 meters. Its wind velocities offshore are expected to be much higher. Dongtai is Dr. Pao's hometown. With the help from Enhancement Partners, on March 17, 2005, Dr. Pao received a letter of support from a London bank that the bank intends to support ecoPower financially to develop large-scale windfarms in China, up to $400 million in equity and debt, subject to certain conditions. Subsequently, again with the help of Enhancement Partners, Dr. Pao received an offer from a German bank that it would support ecoPower to develop large-scale windfarms in China, up to $1 billion in equity and debt, subject to certain conditions.

Floating-Windfarms-at-Sea™

In October, 2005, Dr. Pao introduced the concept of placing the Floating-Windfarms-at Sea™ in regions at sea with strong wind, using a large number of medium-sized, low-cost, vertical axis wind turbines on submerged floating platforms (Floating-VAWT™). Subsequently, ecoPower registered the trade marks both in the U.S. and China.

To develop the Floating-Windfarm-at-sea™, Dr. Pao is organizing a strong technology team in the U.S., applying the best American technologies in applied mechanics, aerodynamics, composite materials, variable speed generators, power electronics, and offshore platforms,





利達行

FLOOR DESIGN CENTER

"We invite you to visit our Houston Show Room soon to bring your own unique vision to life."

10060 West Sam Houston Parkway South #180 Houston, TX 77099
Tel: 281-498-6486 / 281-498-1680 Fax: 281-498-1762
Email: ritaco@msn.com

to develop a reliable, medium-sized, low-cost 500 kW Floating-VAWT that can be placed in regions at sea with strong wind. And, the Floating-VAWTs can be pulled below the sea surface to avoid the impacts of high wind and waves, in case of hurricanes or typhoons. He has invited his former VAWT development partner, Sandia National Labs, and his former colleagues at FloWind to once again join force with him. In addition, he has invited several leading experts as Senior Advisors to ecoPower, including:

- Professor Su Su Wang, a Distinguish Professor of University of Houston. Prof Wang is a leading expert in composite materials for offshore structures. He is the Director, Center for Composites and Engineering Application for offshore structures, University of Houston. He is also the director-designate for the newly created National Testing Center for Large Wind Turbines, in Houston.
- Professor I. J. Wygnanski, Member, National Academy of Engineering USA. Professor Wygnanski is a world renowned scholar in turbulence and a leading expert in boundary control.
- Dr. K. Benjamin Su, President of Target Solutions, LLC, has many years of experience with the DuPont Company in the development and manufacturing of advanced composite structures and components.
- Professor Steven Pei, Professor of Electrical Engineering and Physics, and Deputy Director of Texas Center for Advanced Materials at the University of Houston. He was formerly the Associate Dean of Engineering for Research at the University of Houston, and a Dept Head at the AT&T Bell Labs at Murray Hill, NJ, USA

The goal is to lower the cost of electricity from Floating-Windfarms-at-sea™ below the cost of coal-electricity in five years, at an estimated development cost of $3 billion. If successful, wind-at-sea can replace fossil fuels as the principal source of energy for electricity generation, and low-cost electricity from wind-at-sea can replace gasoline as the principal source of energy for plug-in hybrid vehicles. Floating-Windfarms-at-Sea ™, when fully developed and implemented, will enable us to take a giant step beyond fossil fuels, and greatly reduce the global energy, air pollution, and climate change problems. In addition, it will greatly reduce the basic conflict between the Islamic extremists and the West – the control of oil supplies. It will make the world a cleaner, safer, and better place to live!