

LED 廠商之競爭策略分析-以 Cree 公司為例

Competitive and Strategic Analysis of LED Companies – A Case study of Cree

邱晶晶

摘 要

照明產業現在正面臨前所未有的革命，發光二極體正慢慢地取代我們所稱的燈泡、燈管。當新科技取代舊科技的同時，產業也跟著洗牌，各國政府莫不傾政府之力來推動照明產業的革命，企圖在產業洗牌後能夠佔據一席之地。目前全球五大 LED 公司分別是日本的日亞化學、豐田合成、美國的 Cree、歐洲的 Philips Lumileds、與德國的 Osram。本論文特別針對 Cree 公司的發展歷程與策略加以分析，期望藉由探討國外公司的優勢、劣勢，提供國內產業一借鏡。

策略是企業一連串搭配的活動組合。本論文以吳思華教授的策略三構面、競技場理論對 Cree 公司的各種活動組合進行分析。由產品範疇、核心能力、事業網路的分析可知，Cree 公司善用事業網路的資源來建立自身的核心能力，並不斷地重新擬定產品範疇。於核心能力的部分，本論文引用周延鵬教授智慧資本理論，透過分析更能瞭解利用專利的商業策略，透過事業網路也能快速地建立智慧資本—核心能力。

本論文認為 Cree 公司發展分為三階段。第一階段 1987~1998 年，為產品範疇的定義時期，以 DOE 與 Defense Department 的美國政府計畫做為研發經費來源、NCSU 的博士生帶入技術能力，並維持一定的合作，而以兩大客戶 Osram 與住友來支持整體公司的營收。第二階段 1999 年~2002 年，Cree 以智財與技術的授權 (Nitres 與 UCSB 技術連結)、訴訟 (Lawsuit partners: NCSU、BU、Rohm 與中村修二)、併購 Nitres 的策略佈局，將營收快速擴張到 2 億美元。第三階段 2003

年以後，Cree 選擇封裝產品、LED 燈具產品進行 10 億美元的營收目標，實際併購 Cotco、LLF 與 Zumtobel 策略合作，以 LED city、LED University、Led workplace，再聯合照明系統伙伴提供光、電、熱的 LED 照明解決方案，推廣與教育更多的 LED 照明。

以策略競技場分析，可以很清楚比較出 Cree 所處的 LED 產業與其他競爭者的競爭態勢，第一個競爭比較層次是產品/服務的「價值/效率」競技場，Big 5 與台廠分屬於價值與效率的兩端。第二層次競爭比較是企業總體的「結構/能耐」競技場，Big5 廠商以專利交互授權形成結構障礙，而台廠處於能耐的一端。第三層次競爭是產業網路的資源比較，Osram、Philips Lumileds、TG、Nichia 以母集團的自身能力而處實力一端，Cree 積極的採用合縱策略串起自身的供應鏈體系，台廠則以台灣內需的上下游供應關係形成自己的體系。Cree 不斷地利用體系的力量來建立競爭優勢，符合四競技場理論的架構。

台灣 LED 產業發展甚早，產業鏈分工完整、研發投入、研發成果、企業獲利、、、等等比起 Cree 公司毫不遜色。

(一) 從價值—效率來看，Cree 擁有產品性能(價值)後，於是 Cree 併購 Cotco，增加規模降低成本，能繼續帶給客戶效率；LED 台灣廠商如晶電，不斷藉著水平整合、增加規模、降低生產成本，達到了良好的效率。接著應當思考給客戶效率的同時，再給予更高的價值。

(二) 從結構—能耐來看，五大廠商藉由專利與訴訟、較長的學習曲線和較大的經濟規模擴充，建立起相當的結構的競爭的進入障礙。台灣廠商如晶電，發展和專利的佈局較五大廠晚，但卻憑藉著工研院研發團隊建立起的技術，再透過

自有研發與產業併購，累積起足夠的能耐。如能再學習 Cree 靈活運用專利與訴訟之策略，能使結構的競爭力更加強大。

(三) 從體系—實力來看，台灣廠商與 Cree 相同，靠的是善用體系的力量來競爭。例如晶元光電、億光電子、光寶電子、、、等許多國內 LED 產業形成一完整、高效率的供應體系。然而台灣的體系實力，從電子業、IT 產業發展歷史來看，多半侷限在製造體系，微笑曲線的最前的研發與最後的品牌通路一直都不發達。

從 Cree 的經驗來看，體系的競爭力可以擴展到製造之外，此時 Cree 正在進行的是建立一個以 Cree 為核心的照明體系，能不能成功是未知數，但對於善於運用體系、創造 Win-Win 的 Cree 來說無疑是一大機會。

因此善用體系競爭的台灣廠商，也可思考如何擴大體系力量的範疇，使體系的分工能夠結合前瞻研究、研發、專利、生產、標準、規範、物流、品牌、行銷等等。

關鍵字：發光二極體、LED、Cree、競爭策略、產業競爭、照明

Abstract

Lighting industry is confronted with an intense revolution that light emitted diode (LED) lighting is replacing traditional lighting. The change of technology results in the change of industry. Every government tries hard to promote the development of LED lighting industry to take over the share in the new market. The top five LED companies (Big 5) are Nichia from Japan, Osram for Germany, Philips Lumileds from Netherlands, Cree from America and Toyota Gosei from Japan. The thesis will analyze the history, management, business and competitive strategy of Cree to provide a good case model to Taiwanese LED companies.

A strategy is performed with a series of actions in a company. The thesis will apply Dr. Se Hwa Wu's Three Dimensions of Strategy and Strategy Arenas Theory to analyze every action in Cree. From the analysis of the three dimensions, it can be observed that Cree is good at employing their business networks to build up their core capabilities and continuously re-define their coverage of product line. The thesis will also apply Prof. Y. P. Jou's Intellectual Property Theory to analyze Cree's core capabilities and elaborate the patent strategies and how to rapidly create the core capability as intelligent capital through business networks of a company.

Cree's development can be divided to three stages. Stage I was the definition of product lines, from 1987 to 1998. Cree obtained their R&D funding from DOE and U.S. Defense Department and their R&D ability from North Carolina State University. Cree's two major customers, Osram and Sumitomo, supported their revenue. From 1999 to 2002, Cree used their intelligent property and technology licensing (allied with Nitres and UCSB), lawsuit partners (NCSU, BU, Rohm and Shuji Nakamura) and merger and acquisition with Nitres to increase their revenue up to 200 million U.S. dollars in the end of stage II. After 2003, Cree used LED packages and LED lighting fixtures to increase their revenue to 1 billion U.S. dollar. Cree merged with Cotco and LLF while establishing strategic alliance with Zumtobel. Cree promoted LED with different projects, such as LED city, LED university and LED workplace. Cree also collaborated with their lighting partners who supported total solutions of optics, electron and heat dissipation, to achieve those promotions.

Through analysis based on the Strategy Arenas Theory, the competitions between Cree and their competitors in the LED industry will become more obvious. The first arena of strategy is a competition of value and efficiency of product/ service. The Big 5 companies occupy the position closer to the extremity of value and Taiwan companies stay closer to the other side of efficiency in the value chain. The second arena is a competition of structure and capability. Big 5 take more advantages by structural block formed with cross licensing, while Taiwanese companies own greater capability of production. The third arena is an industrial networks level, a competition of networks and strength. Cree and Taiwanese companies both use industrial networks as their advantage, while Osram, Philips Lumileds, Nichia and TG use the strength of their own company to maintain their market share. Cree continuously collaborate with and allies outside resources from partners to establish their competition advantages.

Taiwan has developed our LED industry for nearly 30 year manufacturing. The industrial chain, R&D investments, R&D achievement and company revenue are all well established. All these achievements make Taiwanese companies as well qualified as Cree in the LED market.

1. Value vs. efficiency: Cree merged with COTCO Luminant Device Limited, a Hong Kong company (Cotco), to achieve cost down by mass production and to increase production efficiency. A similar example can be seen in Taiwan LED companies, Epistar Corporation. Epistar continuously used horizontal merger and acquisition, to increase production scale, decrease cost and achieve better efficiency in production. Epistar have to perform higher value to their customers at the same time.

2. Structure vs. capability: Big 5 constructed strong entry barriers by patents, lawsuits, longer learning curve and larger finance scale. Taiwan LED companies, Epistar Corporation for example, take the strength of the R&D team of ITRI, in-house R&D, and merger and acquisition to try to catch up on the gap of belated developments and patents arrangement. If Epistar can well apply patents and lawsuit as their strategy, the company would gain more advantage in the competitions.

3. Networks vs. strength: Taiwan LED is similar with Cree to take strength of industrial network. Many LED industries in Taiwan, such as Epistar, Everlight, and

Lite-On, have formed a complete and efficient industrial network. However, the network is limited within manufacturing. From the history of electrical industry and IT industry in Taiwan, it can be observed that R&D and marketing, both extremities of Smile Curve, are usually ill-performed.

According to the case of Cree, the competition of networks can be expanded out of manufacture. Cree is developing a LED lighting industrial networks from the core of Cree. It is still unknown whether Cree can succeed, but there will be a big chance of Cree who know to well employ networks to create Win-Win strategies.

In conclusion, Taiwan companies who well use networks can also think about broadened their networks to combine R&D, manufacture, standardization, SOP, logistics management, trademark and marketing.

Key word : LED, light emitted diode, Cree, competitive and strategic analysis, competition, lighting

