

# 高效率空調外轉子馬達技術開發與應用計畫

High efficient external rotor motor technology development and application in air-conditioning

執行單位

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## 中文摘要

風機類產品耗能約佔全國總用電量的10%，推動風機設備高效率化將是節能減碳之重點工作。本計畫發展之重點包括：

1. 發展外轉子永磁無刷(BLDC)馬達與無感測驅控器之關鍵技術方案及匹配終端風扇應用之創新產品開發，並搭配推廣方案，達成高效率化及高性價比之目標，並落實風機產業變頻化之商品普及化。
2. 為促進國家整體電機產業之技術升級與提高產業附加價值，本計畫以外轉子BLDC馬達之DC變頻化技術，並導入模組化設計與規格標準化，協助產業建構可量產化的高效率外轉子馬達與驅控器商品供應鏈。
3. 同步研擬提昇各項風機與永磁無刷馬達應用之相關產品的節能標章基準值與推動能效分級制度，以促成我國在馬達與風扇產業之技術升級及產品創新，落實國內風扇使用性能全面提昇之節能效益，同時帶動相關產業國際化。

## Abstract

Ventilation devices accounted for approximate 10% consumption of the total power in Taiwan, to upgrade these devices toward higher efficiency will be the important target. This project focus on three objectives:

1. To develop the total solution of external rotor BLDC motor and position sensor-less driver apply on end-products, such as fan applications. With the validation for high-efficiency and cost-performance ratio, this project promotes the popularity of these high efficient end-products.
2. This project develops the DC inverter-fed sensor-less controller and external rotor BLDC motor, induces to modularization design and specification standardization. These technologies will upgrade our country's overall motor-industry level and increase the added value motor product. This project also assists domestic industry to construct the high-quality supply chain.
3. This project also develops some strategies for upgrading the energy-label value and building up the energy efficiency rating in fan products. Thanks to enhancing the added value of related fan products, such as efficient, intelligent, multi-function-oriented technology with highly cost-effective competitiveness, this project helps facilitate the international competence of related domestic industries.

# DC變速外轉子風扇

## DC External-Rotor Ceiling Fan

以外轉子無刷直流電機(Brushless DC Motors,BLDC)馬達技術為基礎，結合驅動控制器、晶片模組等技術實力，開發出具高效率與低速高轉矩的「**DC變速吊扇**」，並期望能結合國內領導品牌廠商的藝術風格設計，共同投入進行跨異業之整合，落實重要零組件國產自主化及可商品化，進一步拓展市場通路。

By using external rotor BLDC motor, drive controller, chip module, and other technologies, a high efficient “**DC variable speed ceiling fan**” which can operate at low speed and high torque were developed. Moreover, the development of “**DC variable speed ceiling fan**” can ensure the localization and commercialization of key components. Considering both aesthetic appearance and useful function of the fan, our team have a cross-domain corporation with the domestic leading companies. With advanced technology alliance , we can further open up a new market.



核准國家 Country	專利類型 Patent Type	證書號碼/專利名稱 Certificate number/Patent name	專利起迄期 Patent start and end
中華民國 ROC	發明 inven	I525962 外轉子永磁無刷馬達 Outer-rotor permanent magnet brushless motor	20160311~20341204
中華民國 ROC	發明 inven	I566504 外轉子式馬達 Outer rotor type motor	20170111~20351011
中華民國 ROC	發明 inven	I596866 外轉子馬達 External rotor motor	20161202~20361201