

擬定企業能源策略

Developing Corporate Energy Strategy

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企業核心價值與能源策略

企業能源策略

- ▶ 不僅是成本(經濟)議題
- ▶ 亦涉及環境議題、政治議題、社會議題……
- ▶ 反映企業核心價值(core value)

『超透明社會』的來臨

Super-Transparent Society

能源感測裝置

Energy and Temperature Sensors

- ▶ 2015, Cisco Systems worked with one of its contract manufacturers in Malaysia to deploy 1,500 energy and temperature sensors on its manufacturing equipment.
- ▶ These more “intelligent assets” read performance data, giving Cisco a detailed view of energy consumption — one that had not been available before.

資料中心(Data Center)

耗能的事實

耗能的因應作法

建立能源策略之必要性

- ▶ 企業應積極思考如何建立有效之能源策略
 - 能源策略反映管理階層之知識與管理能力
 - 能源策略反映管理階層之管理思維

企業能源策略

- ▶ 係指管理者以宏觀角度，透過設定能源策略目的及達成該目的的手段，進而建立能源策略之藍圖與願景，並形成企業之競爭優勢
- ▶ 能源策略係為企業整合策略(integrated strategy)之一環

辨認能源相關之風險與價值驅動因子

Identifying Energy-related Risk and Value Driver

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能源策略報告

- ▶ 能源策略報告應包括
- ▶ 能源策略關鍵要素
 - the critical elements of energy strategy
- ▶ 能源對企業經營模式所產生之風險
 - Risks
- ▶ 重要能源績效指標
 - key energy performance indicators
- ▶ 強調能源策略報告項目間彼此之連結性(connectivity or linkage)與整合性(integration)，如何從重要之能源策略要素連結至重要能源績效指標。

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能源策略報告

▶ 中長期之觀點看待能源策略與績效

- 能源策略報告強調以中長期之觀點看待能源策略與績效，而非僅是短期觀點。
- 能源策略報告應考量企業經營模式是否具長期競爭性之較廣泛觀點

Microsoft 能源策略

微軟永續能源策略

Sustainable Energy Strategy

兩項支柱(twin pillars)

- ▶ 再生能源(Renewable energy)
- ▶ 能源效率(Energy efficiency)

Microsoft – 能源策略目標

- ▶ **碳中和**
 - In 2012, Microsoft's sustainability team won a major victory when the company announced that it would become **carbon neutral** starting the following year.
- ▶ **內部碳費與碳價基金**
 - To achieve this ambitious target, the sustainability department implemented an **internal carbon fee** across all business units.

Microsoft能源績效

North American Wind Deal of the Year (2017) by IJGlobal

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General Manager of Energy Director of Energy Strategy

- ▶ 領導微軟全球資料中心能源策略之發展與執行
 - Leads the development and execution of Microsoft's **global data center energy strategy**
- ▶ 微軟環境永續之承諾
 - As part of Microsoft's overall commitment to **environmental sustainability**

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Microsoft Recognized for Innovative Wind Energy Deal (2017/03)

▶ 電力採購合約

- Power purchase agreements (PPAs) to supply Microsoft datacenters with clean energy

▶ 電網效率

- Leveraging Microsoft technology to help improve grid efficiency

▶ 創新融資安排以降低風險與成本

- Developing innovative financing solutions to lower risk and remove cost barriers to the development of renewable energy projects

Microsoft Recognized for Innovative Wind Energy Deal (2017/03)

- ▶ Through **a new 10-year Proxy Revenue Swap agreement with Allianz Risk Transfer (Allianz)**, Microsoft purchased 178 megawatts from Capital Power's Bloom Wind Project in Kansas to help power Microsoft datacenter in Cheyenne, Wyoming with 100 percent clean energy.
- ▶ Microsoft was the first buyer to participate in this **efficient and cost-effective finance model**, which was designed to help project owners manage the revenue risk associated with developing large-scale wind projects.

In Ireland, Smarter Wind Turbines for a Cleaner Energy Future

Microsoft (2017 October)

- ▶ Microsoft announces a new wind energy project, in partnership with GE Renewable Energy that will soon provide 37 megawatts of new, clean energy to Ireland.
- ▶ A pilot project that adds battery-based energy storage to each wind turbine on the Tullahennel farm in County Kerry – the first direct deployment of **battery-turbine integration** in Europe.

Microsoft (2017 November)

- ▶ the largest onshore wind project in The Netherlands
- ▶ Microsoft signed an agreement to buy 100 percent of the output from a 180-megawatt wind project in partnership with Vattenfall. Construction on the Wieringermeer project will begin in 2018, and we expect it to be operational the following year.
- ▶ **Location adjacent to Microsoft datacenter**

Microsoft (2017 September)

- ▶ **Redesigning Datacenters for an Advanced Energy Future**
- ▶ **Build the world's first gas datacenter.**
- ▶ In this pilot, racks are directly connected to natural gas pipes and fully **powered by integrated fuel cells** instead of traditional electrical gear.
- ▶ What makes this project so disruptive is how radically it simplifies the process of powering servers and how this could almost **double the energy efficiency of datacenters**—all while reducing costs and improving reliability.

報告完畢

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