

工業技術研究院

Industrial Technology
Research Institute

2023 臺泰產業鏈結高峰論壇

2023 Taiwan Thailand Industrial Cooperation Forum

台灣綠色轉型政策下的產業商機

Taiwan's Green Transformation Policy &
Industry Opportunity Toward 2050 Net-Zero

張超群 Jack C. Chang, Ph.D.

工研院 產業科技國際策略發展所 永續資深策略長

Senior Strategy Executive Director, Sustainability

Industry, Science and Technology International Strategy Center (ISTI) of ITRI

2023/09/12



報告大綱

AGENDA



蔡英文總統
President Tsai Ing-wen

世界地球日·共同面對氣候挑戰
On Earth Day, Let's Face the Climate Challenge Together

2050淨零轉型是全世界的目標也是台灣的目標！
Net-Zero Emissions by 2050: A Goal for Taiwan and the World!

把握國際趨勢·規劃2050年達到淨零排放的路徑
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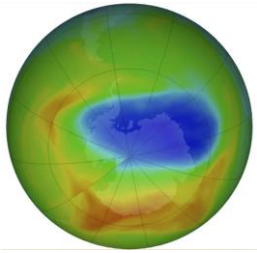
- 全球淨零碳排趨勢
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淨零排放已成普世價值

Net-Zero Emissions Has Become An Universal Value

「淨零排放」已成為政府/企業/大眾所認定之新「普世價值」

“Net-Zero Emissions” has become the new “universal value” recognized by governments / enterprises / the public.



臭氧層破洞
Ozone Hole
(Ozone Depletion)



空氣污染
Air Pollution



海洋塑膠
Marine Debris



循環經濟
Circular Economy



減碳與淨零
Carbon Reduction and
Net-Zero

UN 
environment
programme

50 
1972-2022

淨零排放之國際脈動擴大影響

Net-Zero Emissions Has Gained Increasing Attention And Support Globally

- 全球有 **152*** 個國家宣示淨零排放目標

152 * countries around the world have declared the net-zero emissions target

全球淨零覆蓋率
Global Net-Zero Coverage



淨零數
Net-Zero Number

國家 (Country)	地區 (Region)
152 / 198	147 / 713
城市 (City)	公司 (Company)
253 / 1,177	946 / 2,001

- 國際品牌大廠的「淨零」宣告

Net-zero declarations by major international companies



淨零碳排議題亦為台灣政策重點

Net-Zero Carbon Emissions Is Also A Key Policy Issue In Taiwan

2050淨零轉型，我國邁入淨零追逐時代

2050 Net-zero Transformation, Taiwan is Now in Pursuit of Net-Zero Targets



「2050淨零轉型是全世界的目標，也是台灣的目標！」

“Net-Zero emissions by 2050: A goal for Taiwan and the world!”

Many friends in the industry have already regarded the trend of net-zero transformation as an opportunity. Both supply and demand sides of the market must change their logic of thinking, seize new business opportunities, and strengthen Taiwan’s competitiveness in the global supply chain

朝野立委高度關注2050淨零碳排議題

Members of the Legislative Yuan are highly concerned about 2050 net-zero carbon emissions issues



The Legislative Yuan passed the "Climate Change Response Law" on January 10, 2023, specifying that the national greenhouse gas reduction target is net-zero emissions in 2050, and started the follow-up carbon fee setting work. It is estimated that carbon fees will be levied on 287 large carbon emitters in 2024

青年團體呼籲提出氣候治理7大訴求

Youth groups call for seven demands on climate governance



The Taiwan Youth Climate Alliance put forward 7 major demands, mainly including the "Greenhouse Gas Reduction and Management Act" should be revised as soon as possible; the carbon pricing system should be improved so that enterprises can take social responsibility and connect with the international market

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頒布淨零路徑並修訂法規，因應潮流趨勢

Promulgate Net-Zero Pathway And Revise Regulations To Adapt To Global Trends



The National Development Council announced "Taiwan's Pathway to Net-Zero Emissions in 2050", which promotes 12 key strategies and gradually move towards net-zero emissions by 2050

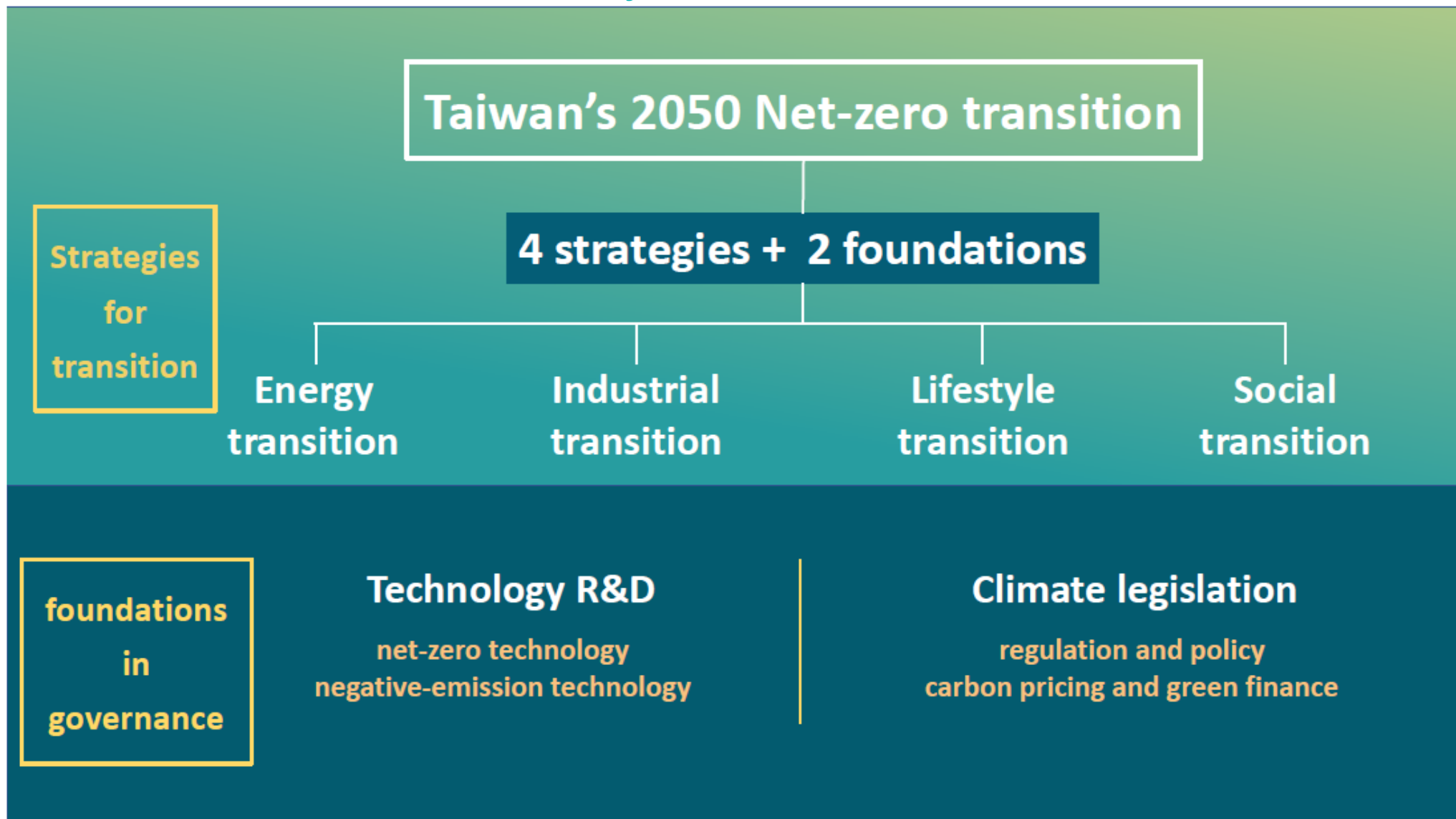
2022/03/30

The Legislative Yuan passed the "Climate Change Response Act", establishing an inter-ministerial cooperation mechanism to promote carbon reduction, and the 2050 net-zero emission target was entered into the law, and it was signed by the President on February 15.

2023/02/15

台灣淨零轉型路徑圖

Taiwan's Pathway To Net-Zero Emissions In 2050



跨部會合作推動12項關鍵戰略，邁向2050淨零排放

Cross-ministerial Cooperation To Promote 12 Key Strategies Towards Net-Zero Emissions By 2050

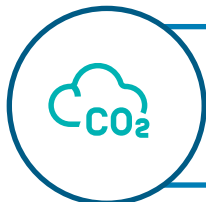


Note : FSC(Financial Supervisory Commission), MOA(Ministry of Agriculture), MOEA(Ministry of Economic Affairs), MOEP(Ministry of Environmental Protection), MOTC(Ministry of Transportation And Communications), NDC(National Development Council), NSTC(National Science and Technology Council)

成立專責機構氣候變遷署，推動相關政策

Establish A Dedicated Agency, The Climate Change Agency, To Promote Relevant Policies

Improve and promote the various sub-acts of the Climate Change Response Act to deal with key issues



Greenhouse gas inventory and registration, inspection and certification agency to manage related work



Plan the carbon fee formulation and collection mechanism, entrust the Taiwan Stock Exchange to establish a carbon trade platform, and handle carbon credit transactions (planned to be announced by the end of November 2023)



Greenhouse gas voluntary reduction program, voluntary reduction credit trading mechanism



Promotion and management of product carbon footprint labeling



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國際大廠減碳趨勢形成低碳供應鏈

Low Carbon Supply Chain Formed By Major Global Companies Adapting To Carbon Reduction Trends

- 全球152國政府及946家大型企業，已設定淨零碳排目標與時間表。超過200家供應鏈成員、採購支出達5.5兆美元的主要買家企業參與碳揭露計畫(Carbon Disclosure Project)，要求供應鏈揭露碳排放資訊。
152 countries and 946 major corporations worldwide have set net-zero carbon emissions targets and timetables. More than 200 supply chain members and major buyers with US\$5.5 trillion in procurement spending are participating in the Carbon Disclosure Project, which requires supply chain disclosure of carbon emissions.
- 國際大廠陸續響應綠色轉型倡議，紛紛要求供應鏈跟進綠化。臺灣為全球科技產業重要供應鏈夥伴，綠色轉型不只是環保、永續的問題，更攸關產業競爭力及未來是否得以生存。
Major global companies have been responding to the green transformation initiative and are requiring their supply chains to follow the green transformation process. Taiwan is an important supply chain partner in the global tech industry, making green transformation not only a matter of environmental protection and sustainability, but also a matter of industry competitiveness and future survival.



Apple

2030 supply chain adopts renewable energy to achieve carbon neutrality



Google

2030 All data centers and operating units use zero-carbon energy



Establish a sustainable supply chain by 2030 and reduce 1 billion tons of GHG



Starbucks

Coffee production is carbon neutral and uses 50% less water in 2030



2030 Use 100% recycled or reused packaging



Unilever

Scope 2+3 net zero emissions in 2030, promoting bio-energy



2040 to achieve net zero carbon emissions in the supply chain and develop hydrogen batteries



Volkswagen

By 2030, 40% of vehicle models will be electrified, and by 2050, the value chain will be carbon-neutral



Amazon

2023 50% of shipments are zero carbon emissions



IKEA

15% less GHG in the supply chain than in 2016, fully using renewable and recycled materials



Meta

By 2030, the GHG emissions of the whole company and the supply chain will be zero



台積電

Zero incremental emissions in 2025 and return to 2020 emissions in 2030

面對全球環境永續變革浪潮 臺灣高科技產業應積極實現供應鏈永續價值

Facing The Wave Of Global Transformation Trend, Taiwan's High-Tech Industries Should Actively Establish Sustainable Supply Chain

對產業啟發

Inspiration for the Industries

- Taiwan's economy is export-oriented. In 2020, the total export value was US\$335.4 billion, of which US\$22.9 billion was exported to the EU (accounting for 6.6%) and US\$50.6 billion was exported to the United States (accounting for 14.6%). Among them, the export of electronic/information and communication products accounted for about 33% of the total export.
- In January 2023, the Legislative Yuan passed the "Climate Change Response Law", and it is expected that carbon fees will be levied on 287 large carbon emitters in 2024.
- Facing the wave of global environmental sustainable changes, Taiwan's high-tech industries will face the risk of carbon tariffs; for example, the manufacturing of ICT and Audiovisual Electronic products, should accelerate the layout of "green transformation" .
- Taiwanese companies have actively responded to initiatives such as RE100, SBTi, TCFD, and ESG without delay, so as to realize the sustainable value of the supply chain.

臺灣製造業面臨碳關稅的風險

Taiwan's manufacturing industry exposed to the risk of carbon tariffs

Industry	Value-Added Percentage	Carbon Emission Ratio	Exports as a Share of Total Demand
石油及煤製品	0.9%	4.5%	28%
食品飲料及菸草業	1.6%	1.2%	6%
紡織成衣及服飾業	0.7%	1.9%	37%
紙漿、紙及紙製品業	0.3%	1.7%	14%
印刷業	0.2%	0.1%	4%
化學材料製造業 Chemical Materials Manufacturing	2.2%	14.4%	32%
化學製品製造業	0.8%	0.4%	14%
橡膠製品製造業	0.3%	0.3%	34%
塑膠製品製造業	0.8%	1.3%	33%
非金屬礦物製品	0.6%	3.1%	11%
金屬基本工業 Basic Metal Industry	1.6%	9.1%	18%
金屬製品製造業	1.9%	1.5%	36%
機械設備製造業	2.5%	0.5%	31%
電腦通信及視聽電子產品製造業 ICT and Audiovisual Electronics Manufacturing	15.0%	10.6%	59%
運輸工具製造業	1.4%	0.6%	26%
其他工業製品	0.8%	0.6%	30%

究院

臺灣業者加速綠色轉型

Taiwan Industry Accelerates Green Transformation

臺灣SBTi業者110家*

110 SBTi companies* in Taiwan



臺灣RE100業者28家

28 RE100 companies with HQ in Taiwan



*Updated on 2023/07/31

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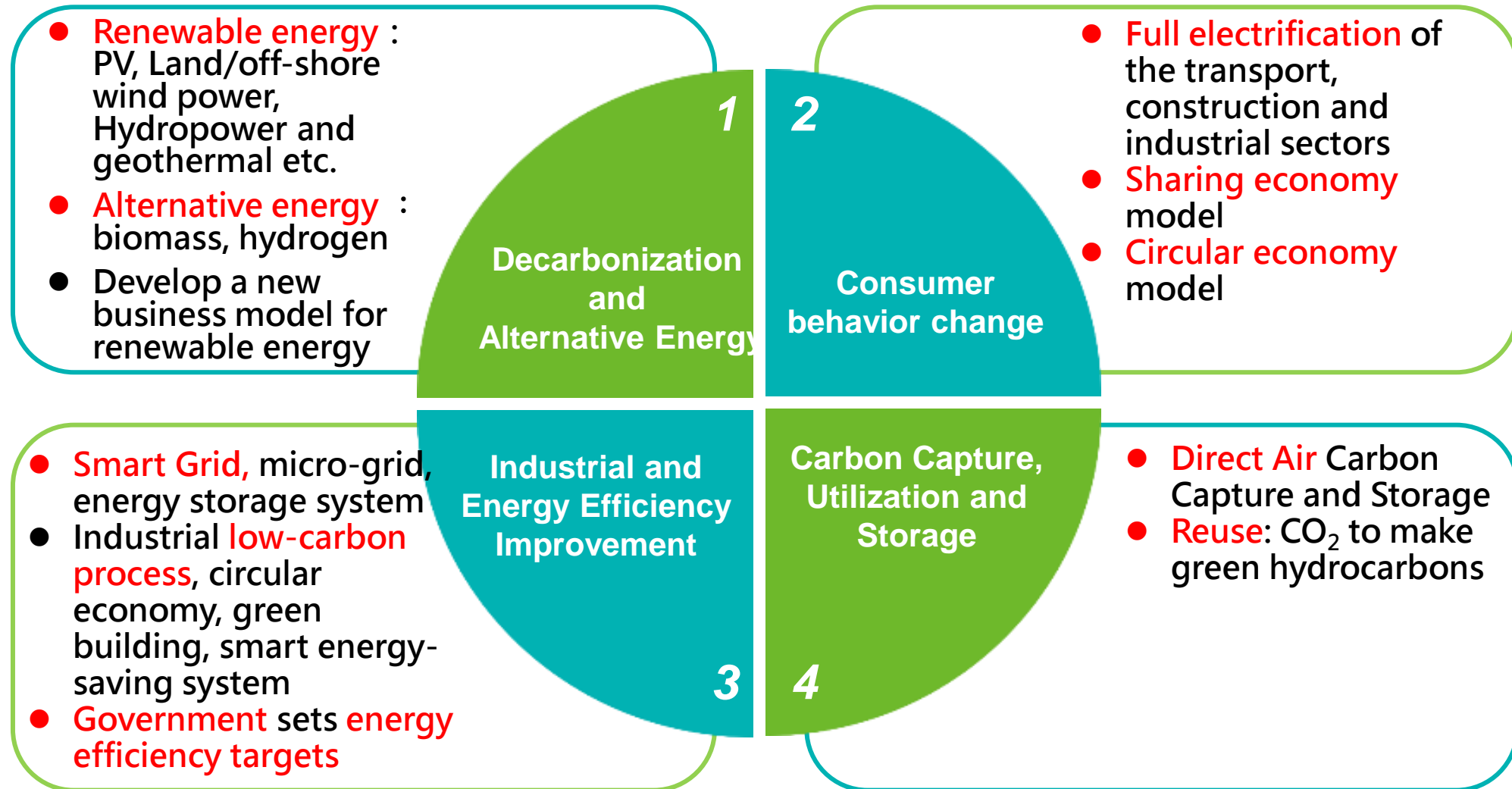
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盤點各國政府與企業淨零排放路徑

Pathways To Net-Zero Emissions Of Governments And Companies

4大路徑引導科技及企業朝向淨零排放

4 major pathways to guide technology and enterprises towards net-zero emissions



國際低碳趨勢因應方法

Global Trends In Low Carbon Practies

導入碳風險評估

Introduction of carbon risk assessment

- Assess the cost impact of climate change on companies, introduce ESG, TCFD and other management models, and incorporate environmental and climate factors into investment portfolios and corporate management processes.

提升綠能與能效

Promoting green energy and energy efficiency

- According to Taipower's energy mix, green energy applications and energy-saving measures are important low-carbon transformation channels.
- Manufacturers can set up renewable energy power generation, purchase green electricity, and improve the energy efficiency of equipment, which can directly reduce carbon emissions in the production process.

盤點、管理碳排放

Taking inventory and managing carbon emissions

- Strengthen the inventory of carbon footprint of product manufacturing process, plan the path of industrial carbon neutrality, disclose information on carbon footprint of enterprises, and meet the requirements of international buyers.
- Improve the carbon reduction awareness and related capacity training of corporate stakeholders.

鼓勵自然保育固碳

Encouraging nature conservation and carbon sequestration

- Environmental restoration has multiple values such as consolidating carbon sinks and soil and water conservation.
- Through specific verification standards, forest carbon sinks can be processed and certified as carbon credits for trading.

全球低碳發展 激發綠色商機-1

Global Low Carbon Development: Stimulating Green Business Opportunities -1

儲能

Energy Storage



- Countries have strengthened green energy investment to achieve net-zero carbon emission targets, green power has been largely connected to the grid, and the demand for stationary energy storage has increased.
- Biden's Build Back Better Act has launched green infrastructure business opportunities.
- Japanese companies can purchase foreign equipment for JCM green project subsidy system, and companies can cooperate with Japanese companies.

微電網

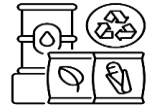
Microgrid



- In recent years, extreme weather and energy prices have caused power supply problems, and important facilities and emergency service units are in urgent need of advanced microgrid backup power.
- The scale of the microgrid system is flexible, and the entry threshold for the small and medium-sized system market is relatively low, which provide new opportunity to cut in.
- It is recommended to provide microgrid product design with large industrial and commercial groups in Europe and the United States for medical facilities, schools, etc. as key customers.

循環材料

Circular Materials



- Consumers' awareness of sustainable consumption has increased, and the EU has successively promulgated sustainable product policies.
- It is recommended to master the application policy of recyclable parts of international brands, as well as the application trend of low-carbon materials for industrial products in the future, and cooperate with the industry to develop related materials.
- Pay attention to the development of the international green certification system and label, and strive for green procurement business opportunities for European and American brands.

全球低碳發展 激發綠色商機-2

Global Low Carbon Development: Stimulating Green Business Opportunities -2

智慧綠建築

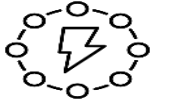
Smart Green Building



- Building is one of the main carbon emission entities, in order to meet the carbon neutrality goal of 2050, the international low-carbon building is expected to reach a market of 76.4 billion US dollars in 2024.
- Public buildings, high-energy-consuming factories, and commercial buildings have a high willingness to actively install energy management systems to reduce their energy cost.
- Due to the high proportion of building energy consumption in Europe and USA, the construction of low-carbon or zero-carbon buildings will be strengthened in the future, as well as the energy efficiency improvement of existing buildings. It is recommended that industry players pay attention to the relevant new standards in Europe and USA, and establish cooperative relations with local building materials and construction developers to strive for business opportunities.

ESCO整合國際服務

ESCO Integrated International Services



- With the vigorous development of the international low-carbon market, business opportunities for Energy Service Company (ESCO) have emerged.
- ◦ The international ESCO market focuses on government procurement markets such as public services, schools, and hospitals. North America and the European Union promote the development of smart cities and become the largest energy service market.
- Private companies can actively cooperate with government agencies or large industrial and commercial groups in Europe and the United States to promote ESCO business opportunities for local key infrastructure construction.

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永續相關商機持續成長

Sustainability-related Business Opportunities Keep Growing



Selected Segment Growth Rate	Total Market CAGR
▲ Operations CAGR 20.6%	32.3%
▲ Strategy CAGR 28.0%	
▲ Finance and accounting CAGR 33.3%	
▲ Human capital management CAGR 57.4%	
▲ GRC consulting CAGR 33.1%	

Evolution of laws and regulations, industry development trends, and consumer attention, etc., accelerate the sustainable transformation of enterprises

According to IDC survey :

- From 2020 to 2025, corporate ESG-related service spending will grow at a CAGR of 32.3%
- In 2020, the global ESG-related service expenditure is about 38.9 billion USD, and it is estimated that the market will exceed 158 billion USD by 2025

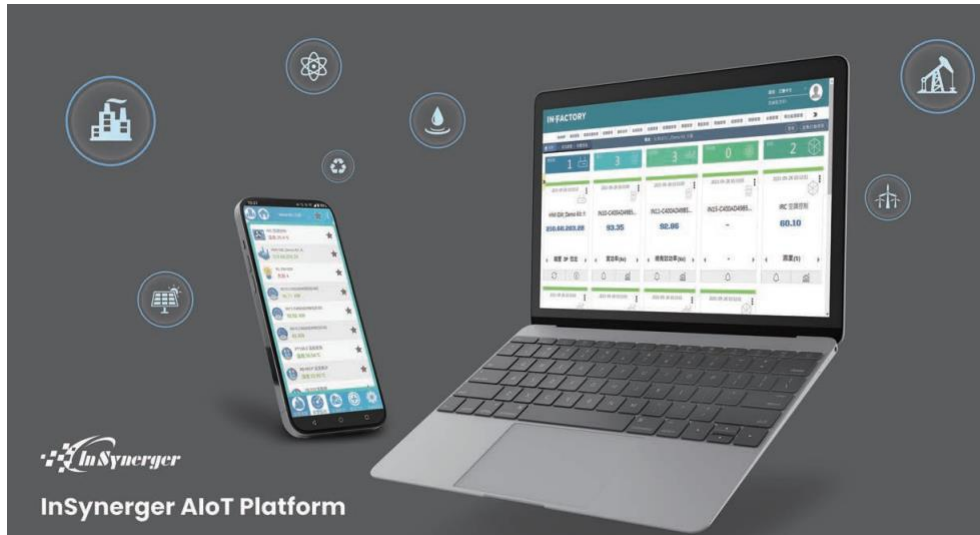


IEA : To drive the energy transition to net-zero emissions by 2050, it is estimated that we will need to invest up to US\$5 trillion by 2050

永續是門好生意

Sustainability Is A Good Business

思納捷科技 (InSynerger Technology Co.)



Develop cloud-based energy and electromechanical equipment AI management solutions, through energy monitoring and AI data analysis, to help customers understand energy usage and environmental conditions, thereby improving energy efficiency and achieving the dual goals of cost reduction and carbon reduction
Honor : 2021 Business Startup Award

鉅田潔淨技術 (JuTian Cleantech Co.)



Natural agricultural waste is recycled into plastic-free, low-carbon, biodegradable cup & tableware
Honor :

- 2022 Business Startup Award
- 2022 Taiwan SME' s Innovation Award

工研院推出永續碳管理平台

ITRI Sustainable Carbon Management Platform

ITRI established a sustainable carbon management platform that can calculate and verify carbon footprints, assess reduced carbon emissions, examine hotspots, analyze product life cycles, and train personnel.



Source: https://www.itri.org.tw/english/ListStyle.aspx?DisplayStyle=01_content&SiteID=1&MmmID=1037333532467607737&MGID=1163472431434540276

臺灣產官研攜手合作 推動淨零碳排

Taiwan Industry, Government And Academia Collaborate To Promote Net-Zero Carbon Emissions

氣候商機推動聯盟

Business Action on Climate Change (BACC)



台灣氣候聯盟

Taiwan Climate Partnership



台灣淨零行動聯盟

Taiwan Alliance for Net Zero Emission



產官研攜手宣示2050淨零碳排

Taiwan Industry, Government and Academia Collaboration to Promote Net-zero Carbon Emissions by 2050



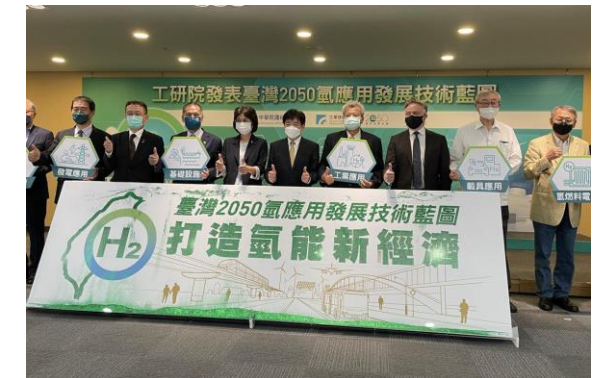
工研院淨零永續策略辦公室

ITRI Net Zero and Sustainability Strategy Office



工研院發表「氫能發展藍圖」

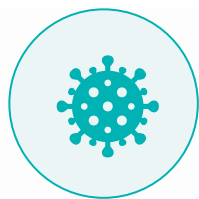
ITRI Releases "Hydrogen Energy Development Roadmap"



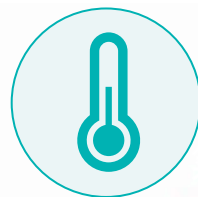
面對未來趨勢浪潮，企業要以數位和綠色轉型應萬變

Facing the wave of future trends, enterprises must adapt to the changes with digital & green transformation

Major trends



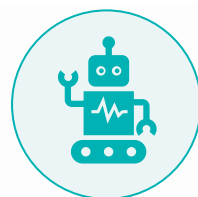
New norm
After Covid-19



New consumerism
for climate change



Geopolitics &
supply chain
restructuring



S&T progress
Frontrunner
Disruption



Cross-domain
collaboration create
new industries



Demographics
induced new
customers

世界經濟論壇(World Economic Forum)

Future corporate competitiveness is composed of three growth drivers: **Smart growth** that emphasizes innovation and digital capabilities, **Sustainable growth** that pursues energy conservation and green transformation, and **Inclusive growth** providing equal opportunities to prevent anyone from being left behind

資誠 (PwC)

Agility and **Trust** are the keys to successful companies in the future

Industry response

Digital Transformation

Use digital technology to "change the value provided to customers, and also change the way of providing value", and become an organization that focuses on customer value and experience, and is constantly updated and transformed



Green Transformation

Utilize green technology and innovation to create a sustainable industry, transportation and environment, drive the development of a green economy, and become an engine that promotes green growth and implements sustainable development

謝謝

Thank You



張超群 永續資深策略長

Jack C. Chang, Ph.D.

Senior Strategy Executive Director, Sustainability

ISTI of ITRI

+886-3-5912480

jack_chang@itri.org.tw

工研院產科國際所團隊：

蘇孟宗、林志勳、謝志強、王孟傑、洪德芳、岳俊豪、
陳嘉茹、張裕斌、陳宗胤

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