

大學價值與創新：永續發展



RACE TO ZERO

葉欣誠 國立臺灣師範大學永續管理與環境教育研究所

新時代關鍵詞：永續、ESG、碳中和、淨零排放

2021 ...

ESG 永續台灣
9月8日下午2:00 · 已讀

#富邦證券投資報告【「減碳」不僅是全球趨勢，更能帶動產業起飛！】

歐盟碳關稅2023年上路、美國宣布重返巴黎協定、中國今年開啟碳交易平台等...，這些重大政策都在傳達相同的核心訊息，如何在2050年達到碳中和目標，降低碳排放量的商機，已經成為未來產業發展的趨勢。

未來五到十年，會有哪些產業扮演重要關鍵角色、帶動業績起飛、值得我們投資人注意呢？點擊了解更多！👁️

#碳中和 #再生能源 #儲能系統 #電動車 #富邦金控



ESG.BUSINESSTODAY.COM.TW ✓

碳中和商機起飛再生能源、儲能產業及電動車 將迎來未來五到十年的黃金時期 - ESG永續台灣

瞭解詳情

2022 ...

ESG 永續台灣
2021年7月19日 · 已讀

【有鑒於全球暖化危機近在咫尺，愈來愈多指標型金融機構積極與國際接軌...👁️快來看看玉山在達成淨零碳排銀行的具體作法!】

包括2027年前將國內自有大樓改建成綠建築，至2020年底已有十二棟大樓取得綠建築認證、十六棟大樓裝設太陽能發電設備、更將提升再生能源使用比例，預計年底有高達10%用電使用再生能源等...

未來亦會逐步增加，積極朝向淨零排放的目標持續前進。..... 顯示更多

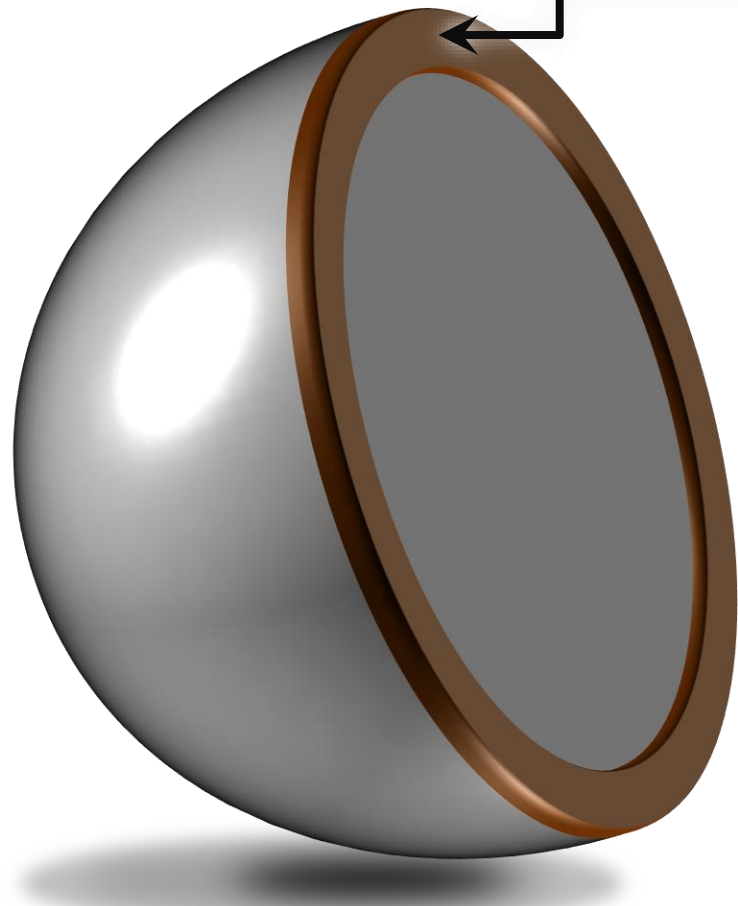


ESG.BUSINESSTODAY.COM.TW

擴大淨零排碳影響力 金融機構加入SBTi成關鍵... - ESG永續台灣
如今，國際間主要有幾大常見的氣候行動「目標」中，碳中和 (Carbon Neutra...

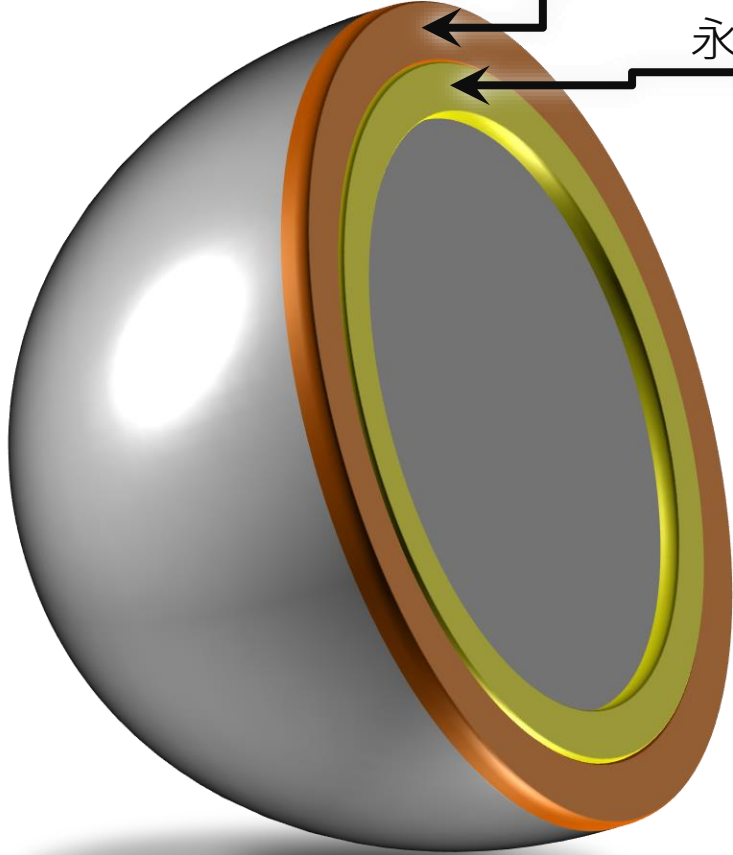
瞭解詳情

永續發展行動、永續發展計畫方案等



永續發展教育、永續發展行動方案等

永續發展策略與目標



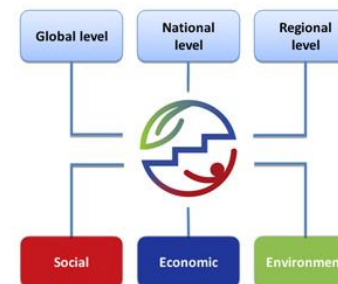
 SUSTAINABLE DEVELOPMENT GOALS



17項目標、169細項目標，目標年為2030年

永續發展教育、永續發展行動方案等

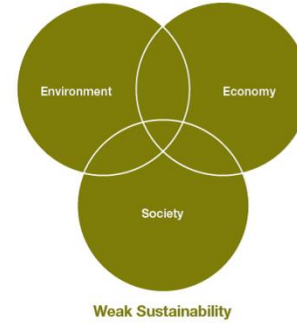
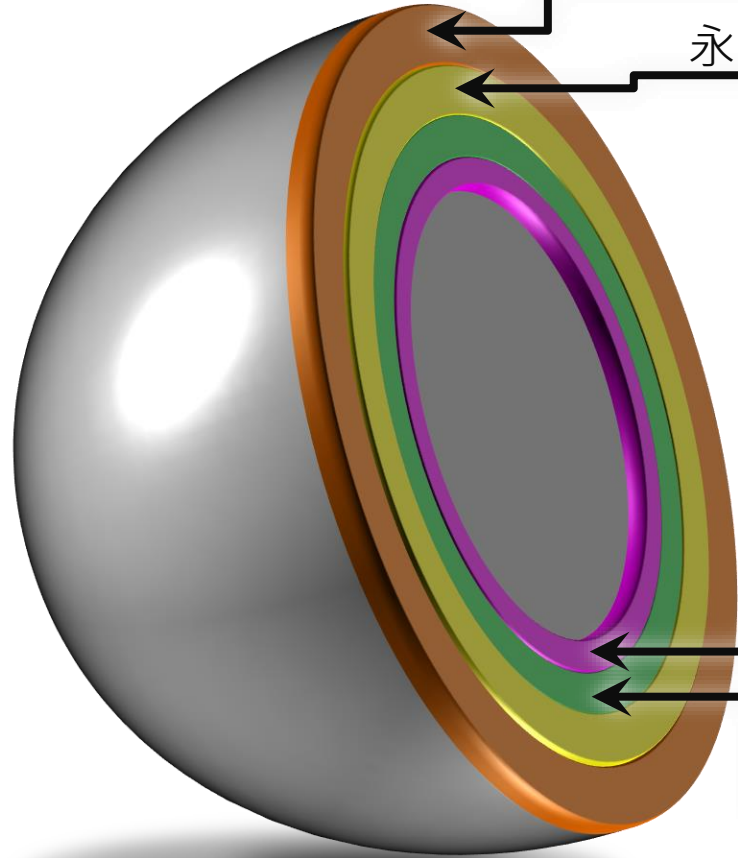
永續發展策略與目標



我們想要的未來：綠色經濟+制度架構

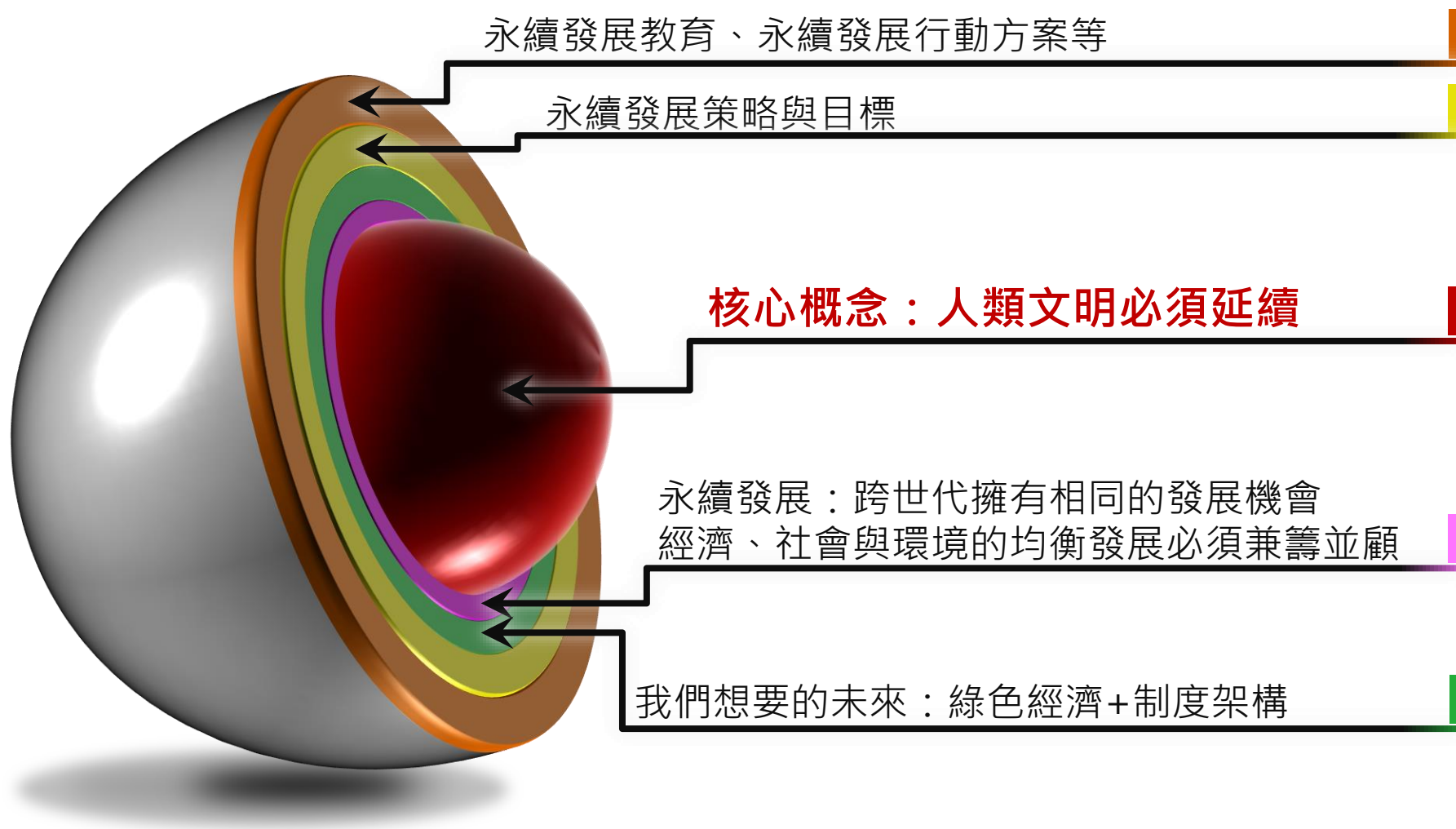
永續發展教育、永續發展行動方案等

永續發展策略與目標



永續發展：跨世代擁有相同的發展機會
經濟、社會與環境的均衡發展必須兼籌並顧

我們想要的未來：綠色經濟+制度架構



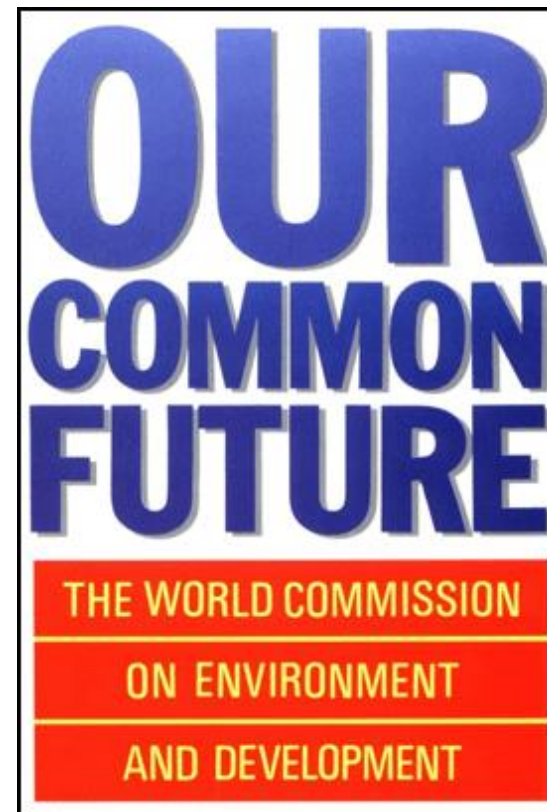
永續發展是人類的永續發展

不是地球的永續發展

- ◆ 1987年「我們共同的未來」報告書中揭示「永續發展」(sustainable development)的標準定義為

既滿足當代人之需求，又不危及下一代人滿足其需求能力之發展
Development that meets the needs of the present, without compromising the ability of future generations to meet their own needs.

- ◆ 永續發展的核心是世代正義
- ◆ 永續發展不只是環境保護，而是社會、環境、經濟的綜合考量



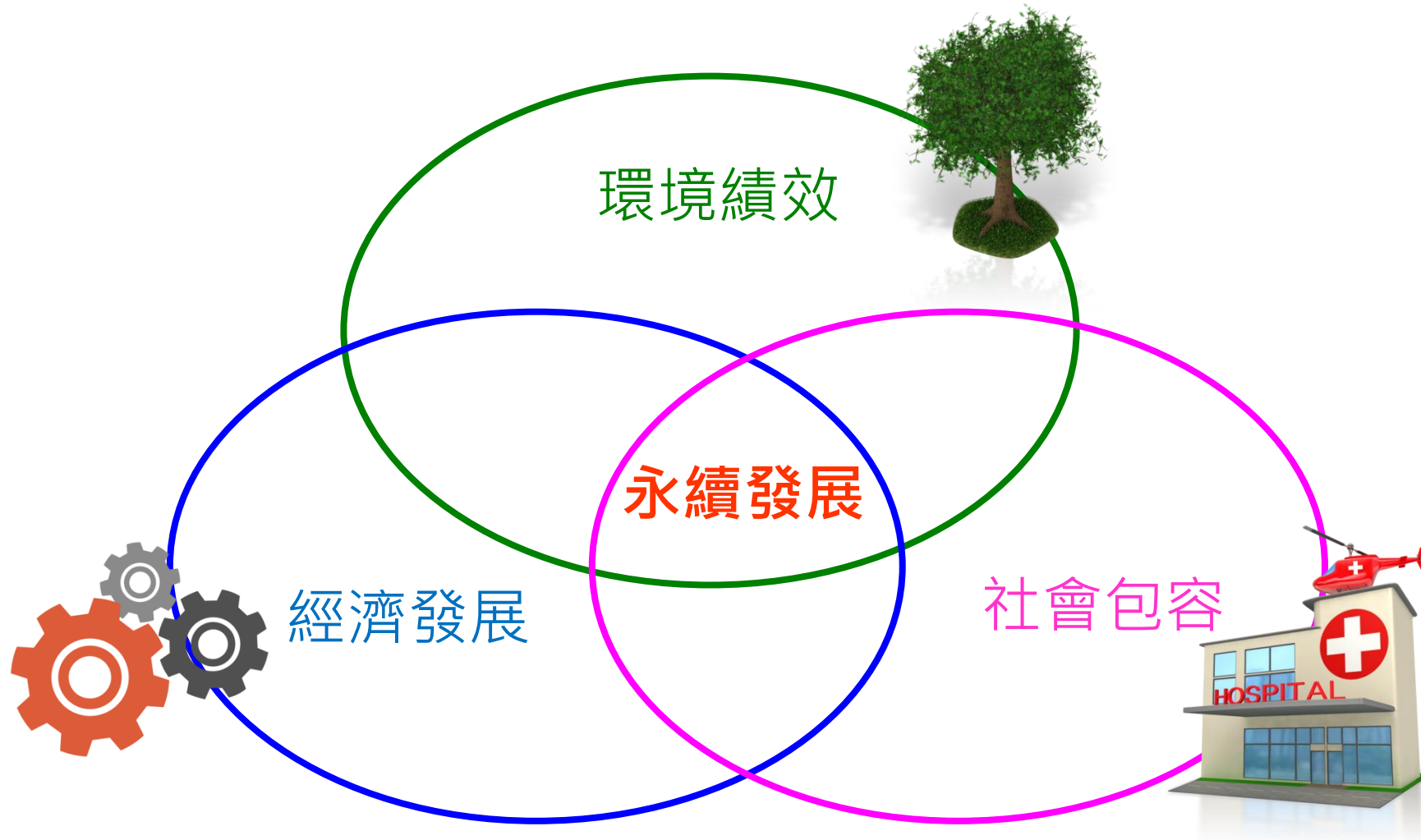
永續發展的歷史脈絡

西方典範，1992開始的三次全球會議

- 1992年，聯合國在巴西里約召開「地球高峰會」(Earth Summit)，規劃全球共同執行永續發展的工作藍圖。
 - 為邁向21世紀做好準備
 - 發表「21世紀議程」(Agenda 21)
- 2002年九月，聯合國在南非約翰尼斯堡召開「地球高峰會十年會議」(Rio +10)，對於21世紀的人類永續發展提出進一步的宣告。
 - 回顧第一個十年
 - 提出消除貧窮、健康促進等基礎關鍵議題
- 2012年6月，聯合國在巴西里約召開「永續發展大會」(Rio+20)，提出「綠色經濟」作為未來人類社會發展的方向
 - 參與人數史上最多
 - 新議題與時俱進

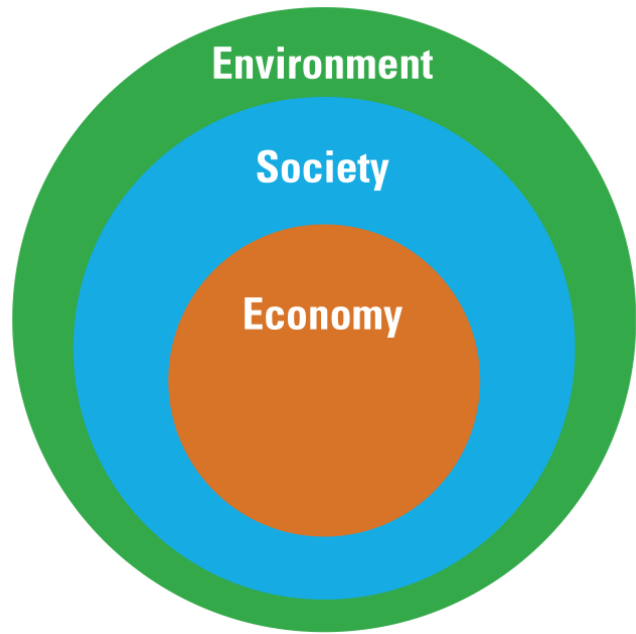


永續發展的三底線(Triple Bottom Lines, TBLs)

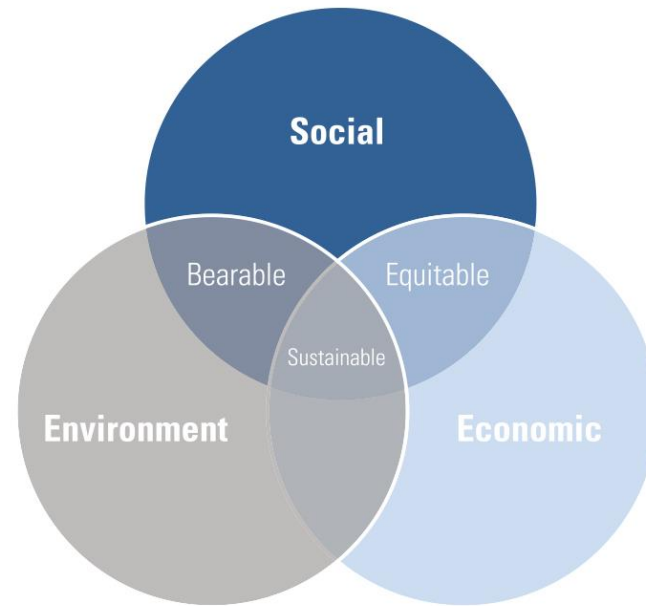


永續發展的不同定位

- **強永續性**：自然資源或有一些重要元素（**critical elements**）是無法交換的。
- **弱永續性**：允許人造資本漸次取代自然資本，損失之自然資源可與人類生產及資金所得交換。



強永續性，同心圓



弱永續性，交叉圓

千禧年目標(Millennium Development Goals, MDGs)

2000~2015

- 2000年，聯合國189個會員國於千禧年大會上通過「千禧年宣言」(United Nations Millennium Declaration)，承諾在2015年之前完成8項「千禧年目標」(Millennium Development Goals, MDGs)。MDGs有8個目標(goals)、21個標的(targets)



大會產出文件：The Future We Want

- 聯合國潘基文秘書長於閉幕致詞時表示「The Future We Want」（我們想要的未來）是人類社會、環境與發展經濟的重要基本原則，內涵包括：
 - 如何以綠色經濟為工具，達成永續發展目標
 - 將研訂永續發展目標(SDGs)
 - 強化聯合國環境規劃署(UNEP)功能
 - 採取必要措施，以提昇國家福祉
 - 提出永續發展之財務策略
 - 建構永續生產及消費架構

距離MDG結束還有三年多



聯合國永續發展高峰會

2015年9月，美國紐約



2014/11

SDGs納入「後2015發展議程(Post-2015 Development Agenda)」

2015/08

「後2015發展議程」更名為「2030永續發展議程(the 2030 Agenda for SD)」

2015/9/25-27

聯合國永續發展高峰會，193個會員國支持並通過「2030永續發展議程」



聯合國永續發展高峰會 2015



翻轉我們的世界：2030永續發展議程

- 序
 - 人民 *people*
 - 地球 *planet*
 - 繁榮 *prosperity*
 - 和平 *peace*
 - 夥伴關係 *partnership*
- 宣言
 - 前言
 - 我們的願景
 - 我們的共同原則及承諾
 - 我們當今所處的世界
 - 新議程
 - 執行方法
 - 後續行動與檢視
 - 行動起來，改變我們的世界
- 永續發展目標及細項目標
- 執行方法及全球夥伴關係
- 後續行動及檢視
 - 國家層級
 - 區域層級
 - 全球層級



<https://goo.gl/t5fsl9>

THE GLOBAL GOALS

For Sustainable Development



17項目標、169細項目標（標的），目標年為2030年

全球永續發展目標

The Sustainable Development Goals

歡迎下載使用



<https://reurl.cc/pD6A7Q>



SDGs是甚麼？

一種新的語言、新的思維模式

- SDGs從2015年9月份開始，是一種全球各領域相互溝通的新語言，直到2030年為止

- 企業界



- 政府界



- 學術界



- SDGs是一種整合思維模式(mindset)

- 多樣化(diversity)

- 包容(inclusion)

- 交互影響(interconnection)

- 包括所有人(no one left behind)

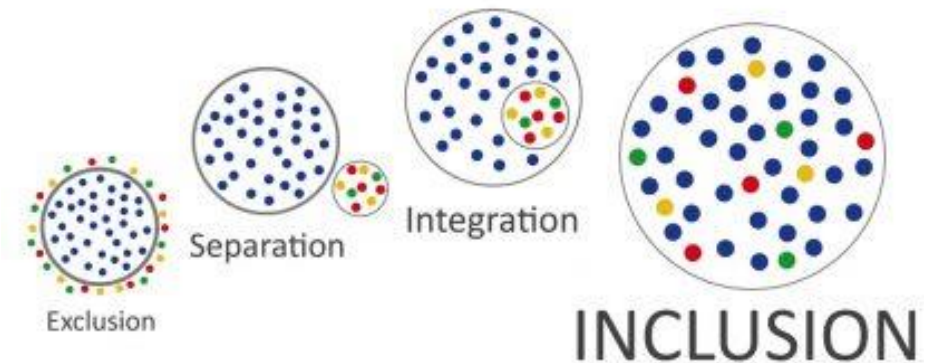


SDGs的核心精神

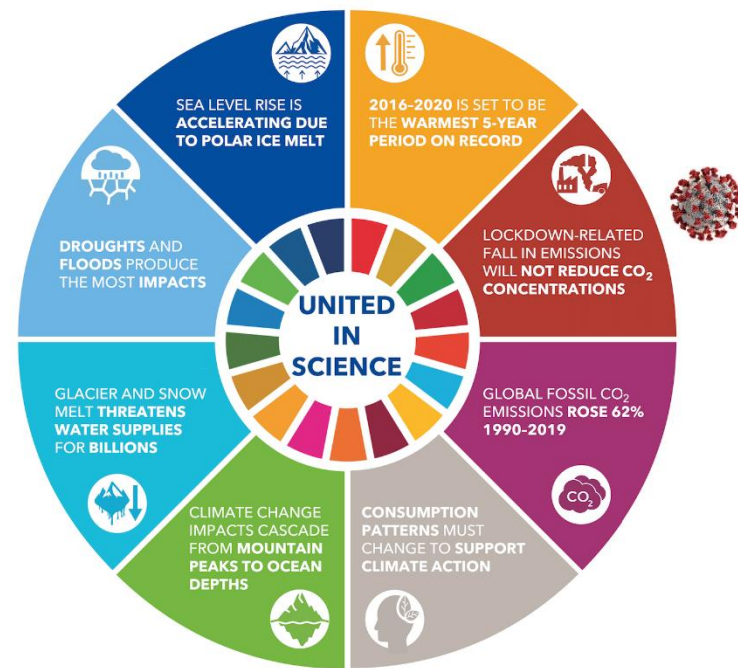
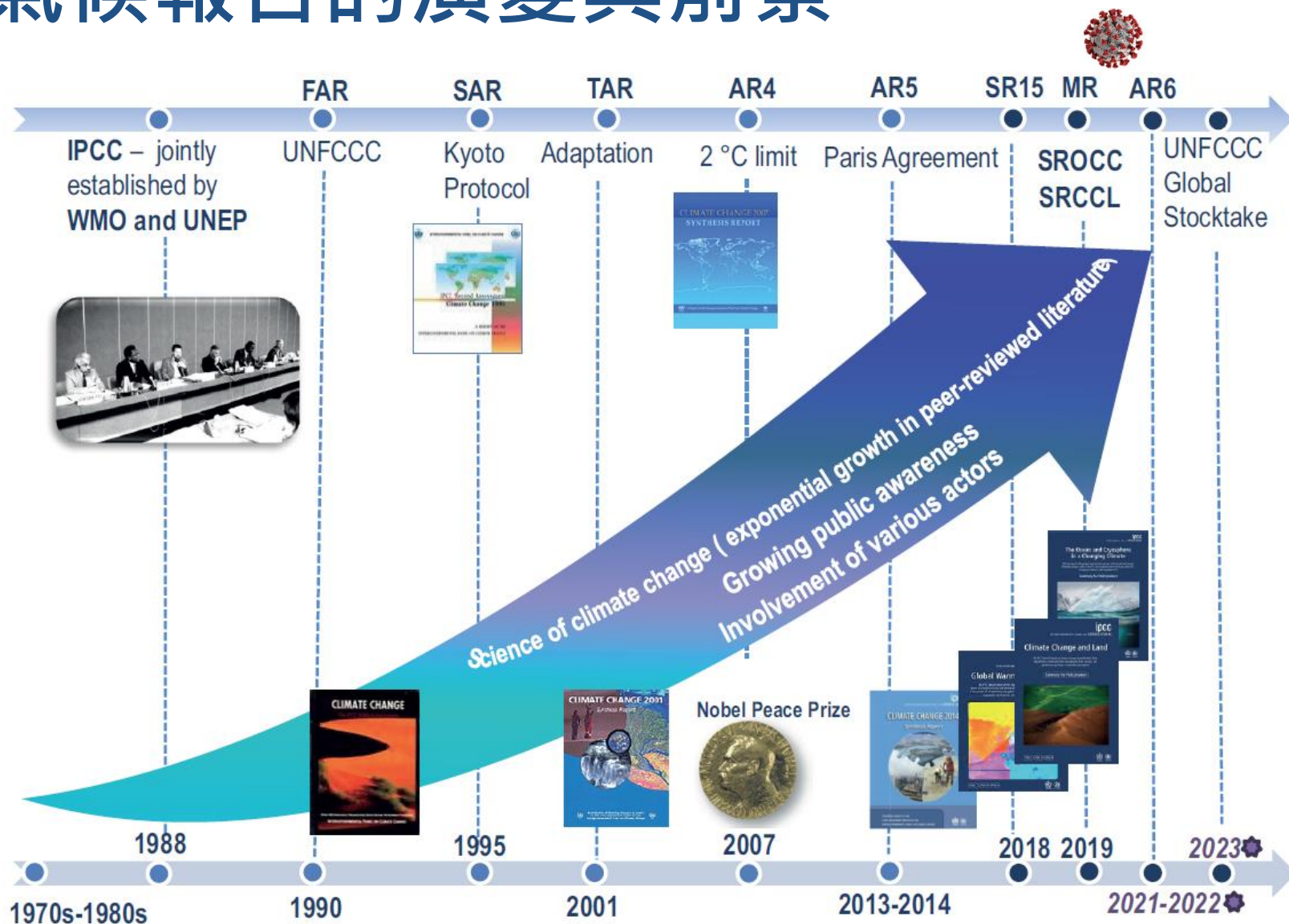
- 多樣性(diversity)
- 包容發展(inclusive development)或包容性(inclusion)
- 全面全人
 - 「不遺漏任何人」(No one left behind)



Inclusion is the new keyword



1988→現在→未來 氣候報告的演變與前景



未來風險發生的機率與衝擊

The Global Risks Report 2021, WEF

機率最高的風險

- ◆ 極端天氣 extreme weather
- ◆ 氣候行動的失敗 climate action failure
- ◆ 人為環境破壞
- ◆ 傳染病 infectious diseases
- ◆ ...

Top Risks by likelihood

- 1 Extreme weather
- 2 Climate action failure
- 3 Human environmental damage
- 4 Infectious diseases
- 5 Biodiversity loss
- 6 Digital power concentration
- 7 Digital inequality
- 8 Interstate relations fracture
- 9 Cybersecurity failure
- 10 Livelihood crises

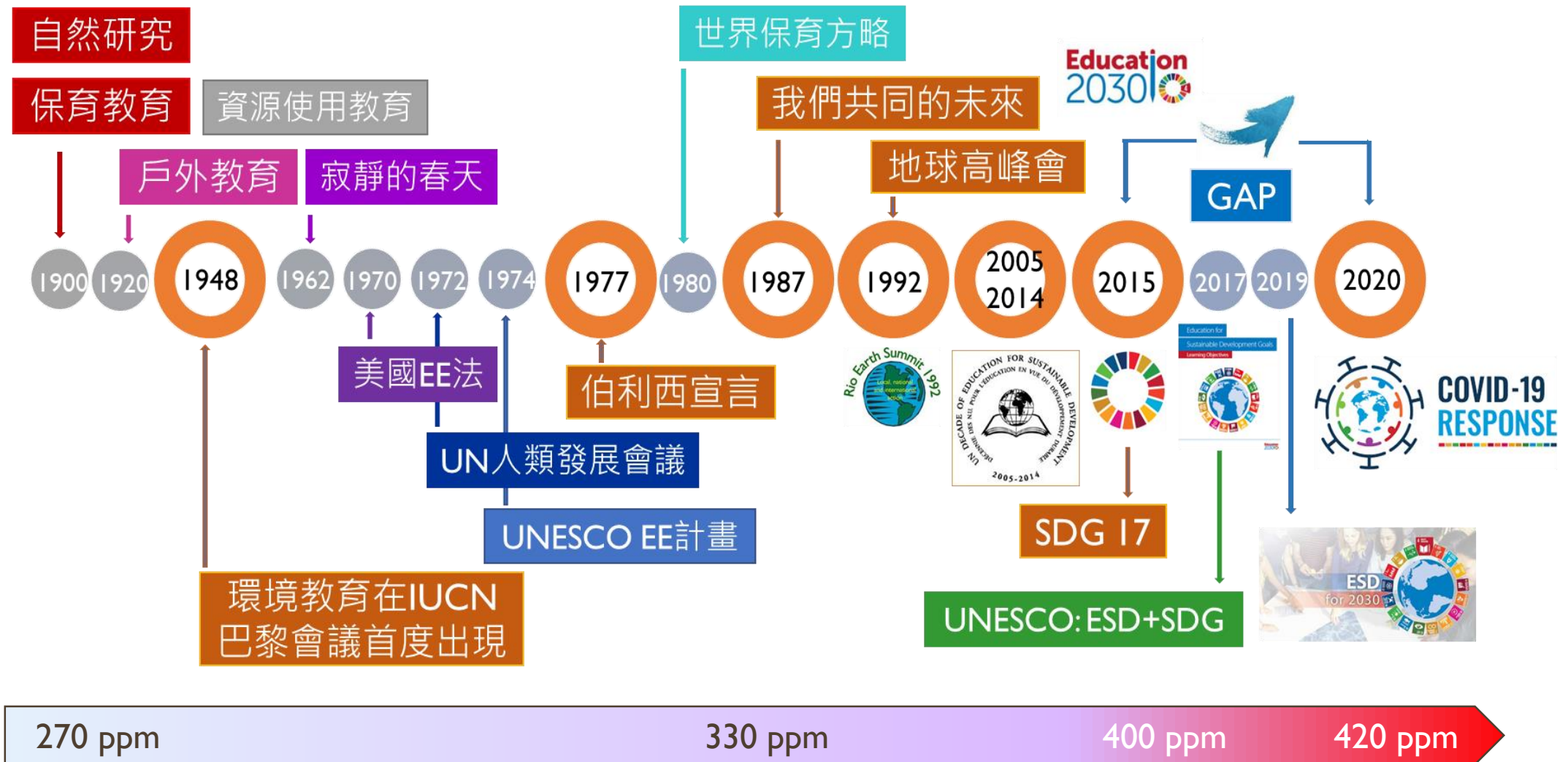
Top Risks by impact

- 1 Infectious diseases
- 2 Climate action failure
- 3 Weapons of mass destruction
- 4 Biodiversity loss
- 5 Natural resource crises
- 6 Human environmental damage
- 7 Livelihood crises
- 8 Extreme weather
- 9 Debt crises
- 10 IT infrastructure breakdown

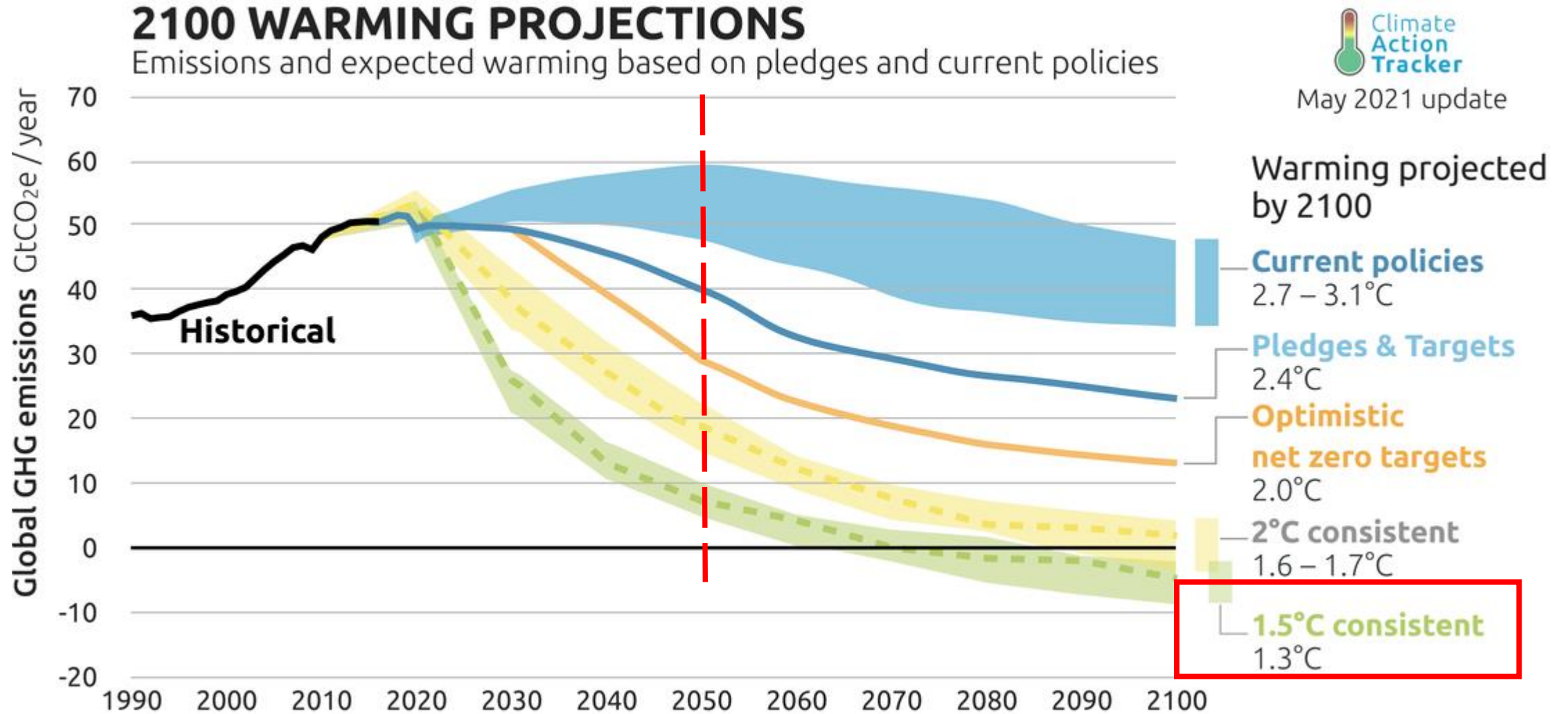


氣候持續變遷

雖然環境教育、永續發展教育持續推動



世紀末升溫不超過攝氏1.5度⇒2050 Net Zero



University of Auckland

RANKED 1st

THE UNIVERSITY
IMPACT
RANKINGS

www.thewur.com



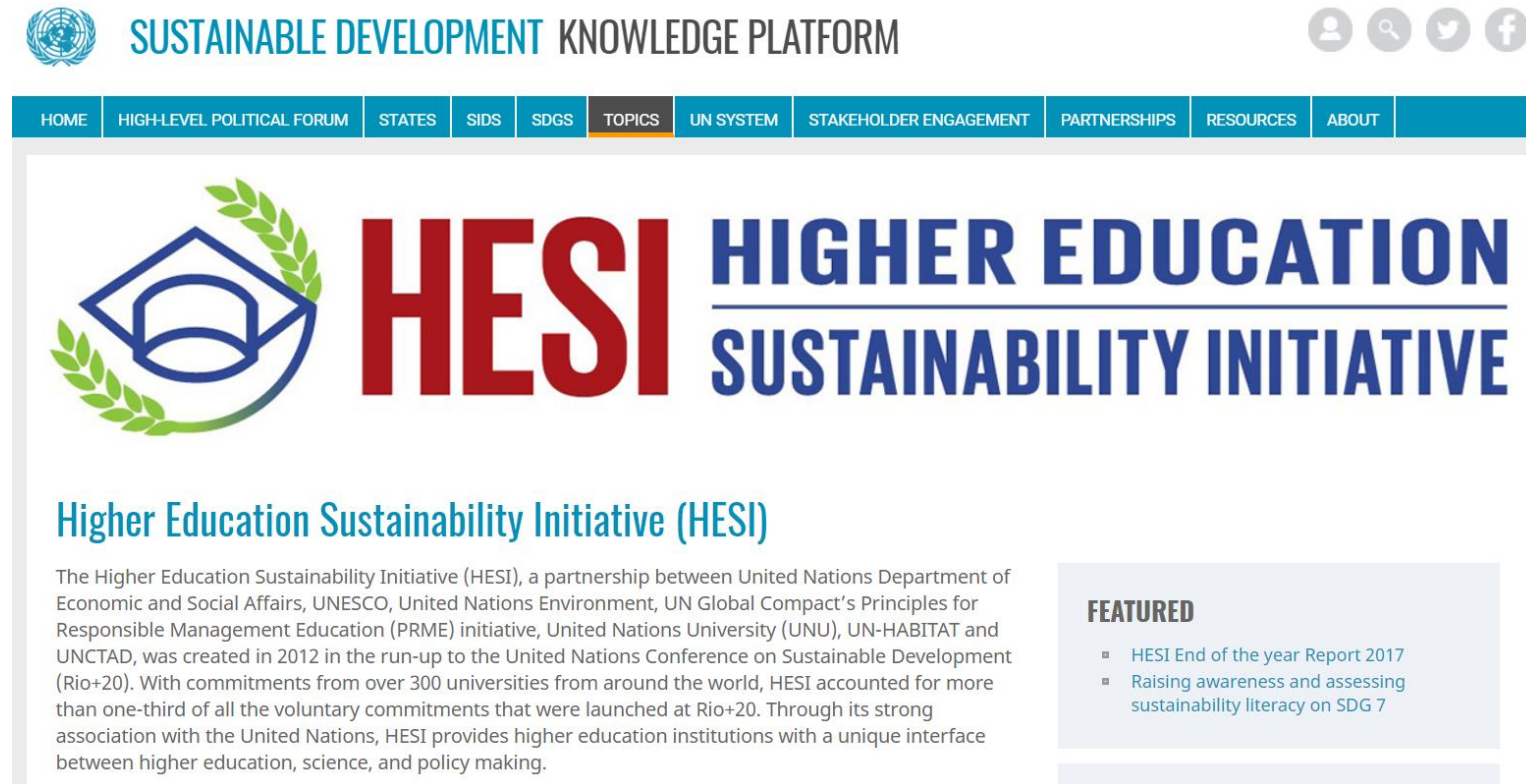
永續發展目標 與高等教育

SDGs and
Higher Education



高等教育永續倡議(HESI)


◆ 聯合國於2012年Rio+20會議後成立，號召各大學致力於永續發展的推動



The image shows a screenshot of the HESI website homepage. At the top left is the United Nations logo, followed by the text "SUSTAINABLE DEVELOPMENT KNOWLEDGE PLATFORM". To the right are icons for user profile, search, and social media (Twitter and Facebook). Below this is a navigation menu with items: HOME, HIGH-LEVEL POLITICAL FORUM, STATES, SIDS, SDGS, TOPICS (highlighted), UN SYSTEM, STAKEHOLDER ENGAGEMENT, PARTNERSHIPS, RESOURCES, and ABOUT. The main content area features the HESI logo, which consists of a blue graduation cap with green laurel leaves, followed by the text "HESI HIGHER EDUCATION SUSTAINABILITY INITIATIVE". Below the logo is the heading "Higher Education Sustainability Initiative (HESI)" and a paragraph of text describing the initiative. To the right of the text is a "FEATURED" section with two bullet points: "HESI End of the year Report 2017" and "Raising awareness and assessing sustainability literacy on SDG 7".

SUSTAINABLE DEVELOPMENT KNOWLEDGE PLATFORM

HOME HIGH-LEVEL POLITICAL FORUM STATES SIDS SDGS **TOPICS** UN SYSTEM STAKEHOLDER ENGAGEMENT PARTNERSHIPS RESOURCES ABOUT

 **HESI HIGHER EDUCATION SUSTAINABILITY INITIATIVE**

Higher Education Sustainability Initiative (HESI)

The Higher Education Sustainability Initiative (HESI), a partnership between United Nations Department of Economic and Social Affairs, UNESCO, United Nations Environment, UN Global Compact's Principles for Responsible Management Education (PRME) initiative, United Nations University (UNU), UN-HABITAT and UNCTAD, was created in 2012 in the run-up to the United Nations Conference on Sustainable Development (Rio+20). With commitments from over 300 universities from around the world, HESI accounted for more than one-third of all the voluntary commitments that were launched at Rio+20. Through its strong association with the United Nations, HESI provides higher education institutions with a unique interface between higher education, science, and policy making.

FEATURED

- HESI End of the year Report 2017
- Raising awareness and assessing sustainability literacy on SDG 7

世界大學校長協會接受SDG

2016年10月，國際大學校長協會(International Association of University Presidents, IAUP)號召全球大學將17項永續發展目標和公民意識的理念融入教學、研究、院校中長程發展策略之中。建立跨校、跨國、跨領域、跨產業、跨世代的共同語言、發展願景與行動目標。



正在發生的新趨勢：ESD+SDG=ESDG

- ◆ 永續發展目標(SDG)正如火如荼地在全世界展開各種形式的應用
- ◆ 永續發展教育+永續發展目標(ESDG)是最新的教育思考方式



UNESCO (2017). *Education for Sustainable Development Goals-Learning Objectives*. de Fontenay: UNESCO.

<http://unesdoc.unesco.org/images/0024/002474/247444e.pdf>

關鍵文件：大學的SDG指引



SUSTAINABLE DEVELOPMENT
SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

HOME

ABOUT

MEMBERS

INITIATIVES

NEWS & EVENTS

RESOURCES

CONTACT

Universities & SDGs

SDG Localisation

Decarbonisation Pathways

SDSN Youth

Getting started with the SDGs in Universities

This new guide highlights the important role universities have in implementing the SDGs and provides practical guidance and examples to inspire further action. [Read more>](#)



Getting started with the SDGs in Universities

Getting started with the SDGs in universities is a guide to help universities, higher education institutions, and the academic sector in Australia, New Zealand and the Pacific to accelerate their contributions to the Sustainable Development Goals (SDGs).

The Guide highlights the important role universities have in implementing the SDGs through their teaching, research, operations and leadership, and provides practical guidance and examples to inspire further action.

The Guide is an initiative of SDSN Australia/Pacific in collaboration with



關鍵文件：大學的SDG指引

- ◆ 由永續發展解決方案網絡(SDSN)澳洲、紐西蘭與大洋洲區域分會製作。
- ◆ 分享若干紐澳大學的實務



在大學加速ESDGs

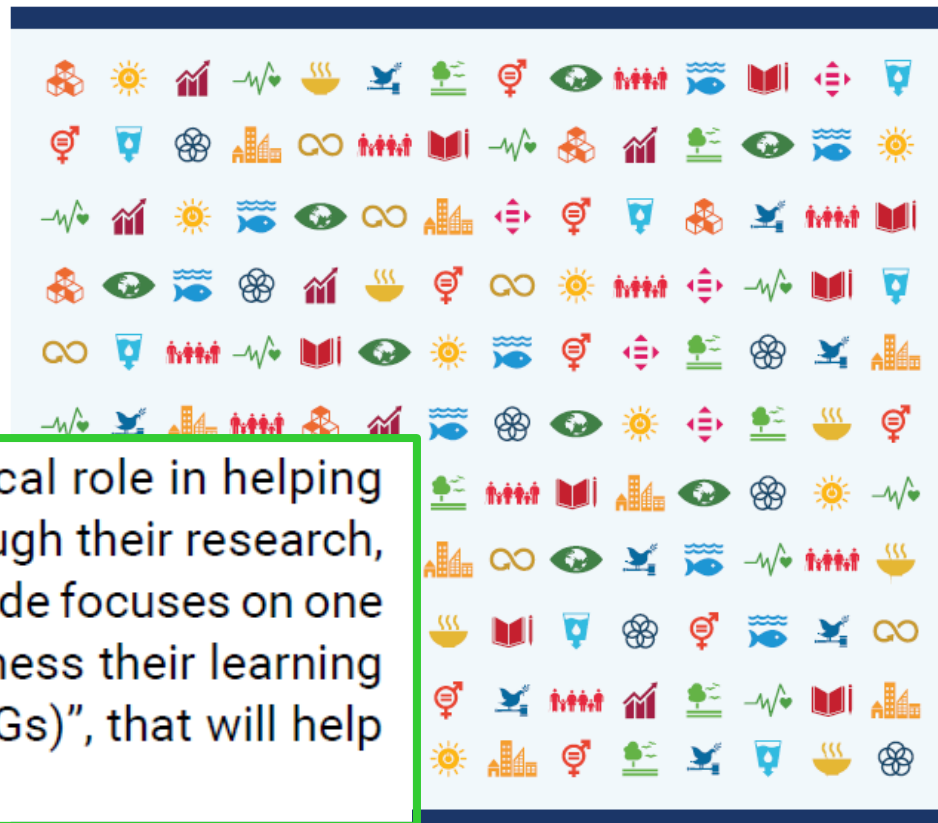
2020年9月發行，回應氣候變遷與COVID-19的新衝擊

- ◆ 在大學推動的主體明確說明為ESDGs，而非僅是SDGs。
- ◆ 強調大學應將ESDGs主流化，以適用於疫情之後的新常態(new normal)。
- ◆ 大學需要擴張現有的教學活動的設定，超越原來的一切如常情境(BAU, business as usual)

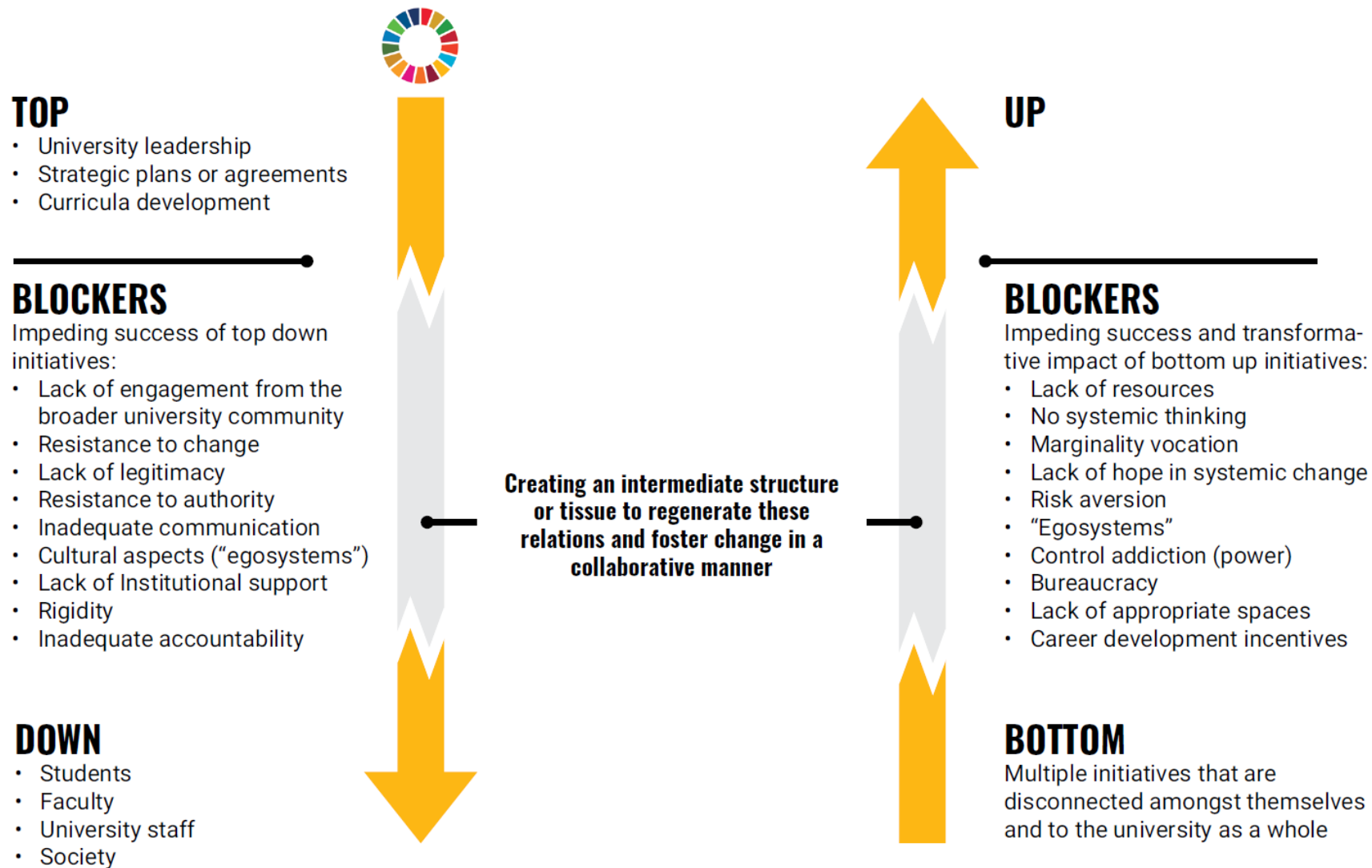
Universities and other higher education institutions have a critical role in helping society achieve the Sustainable Development Goals (SDGs) through their research, learning and teaching, campus operations and leadership. This guide focuses on one of the most important ways they can contribute, which is to harness their learning and teaching functions to provide “Education for the SDGs (ESDGs)”, that will help learners develop the necessary knowledge, skills and mindsets.

ACCELERATING EDUCATION FOR THE SDGs IN UNIVERSITIES

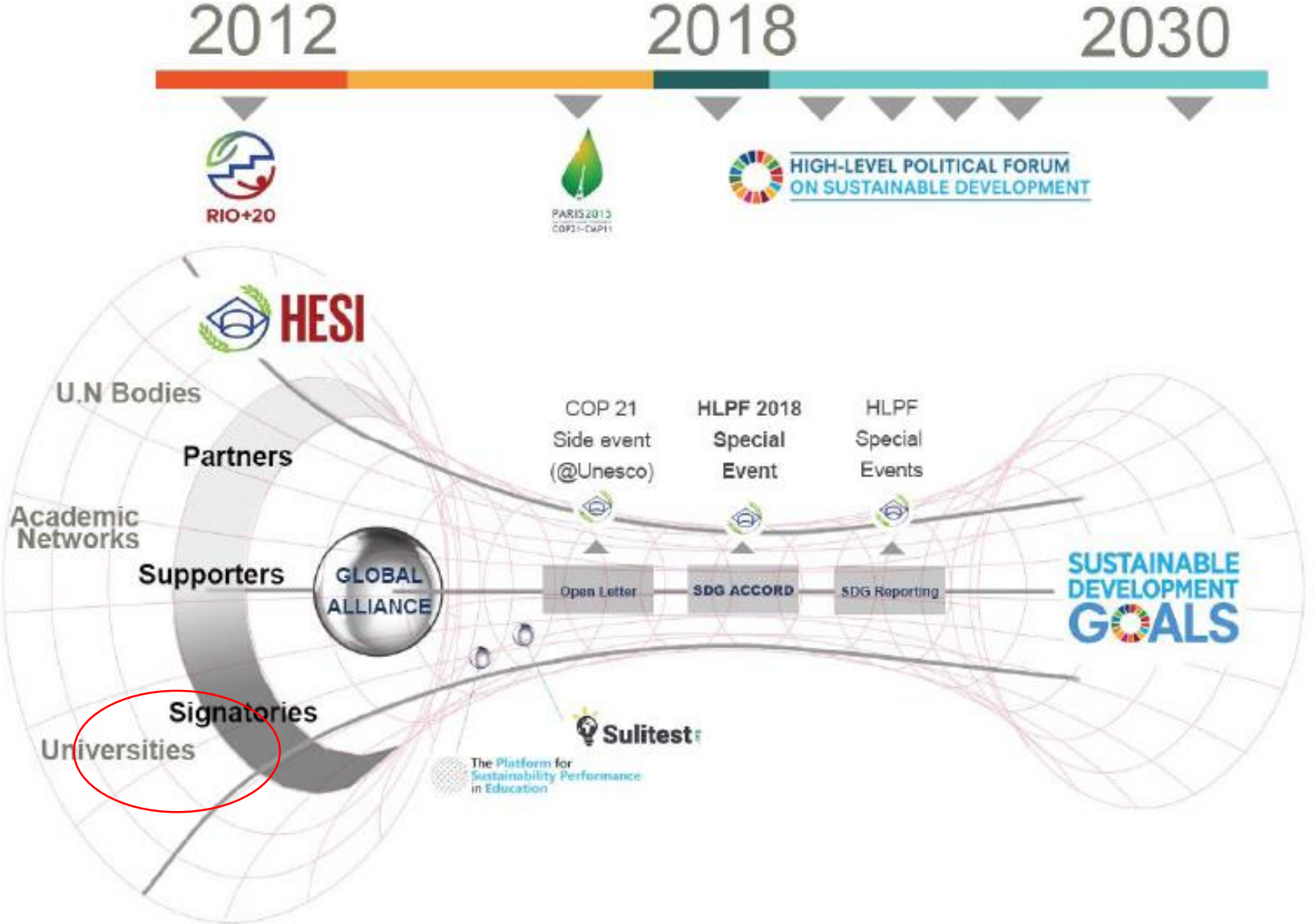
A GUIDE FOR UNIVERSITIES, COLLEGES, AND TERTIARY AND HIGHER EDUCATION INSTITUTIONS



在大學發展ESDGs的主要步驟



HESI連結傳統綠色大學與SDG的脈絡



全球大學與學院SDG協定

The SDG Accord

The University and College Sector's Collective Response to the Global Goals

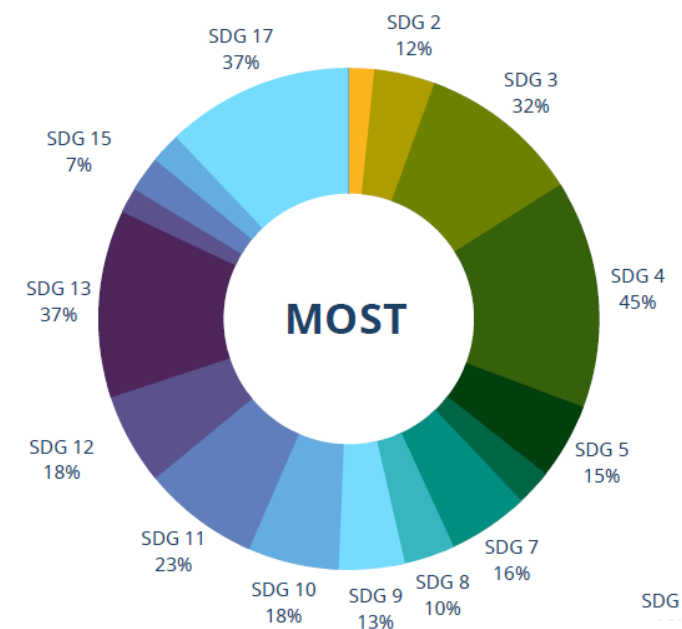


227 Institution Signatories

55 Students' Union Signatories

222 Support Organisations

1734 Individual Signatories



Facilitated by



Supported by



Higher Education Sustainability Initiative

HESI+10
Celebrating 10 years with Higher Education Sustainability Impact

簽署大學的 SDG分佈比例



世界大學排行納入大學影響力排行



PROFESSIONAL JOBS SUMMITS RANKINGS STUDENT ABOUT US



University Impact Rankings 2019

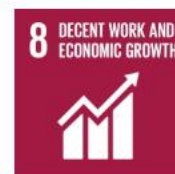
The *Times Higher Education* University Impact Rankings are the only global performance tables that assess universities against the United Nations' Sustainable Development Goals. We use carefully calibrated indicators to provide comprehensive and balanced comparisons across three broad areas: research, outreach, and stewardship.

IN PARTNERSHIP WITH
ELSEVIER

How to get your uni ranked

Read more ...

EXPLORE UNIVERSITY IMPACT RANKINGS FOR INDIVIDUAL SDGS



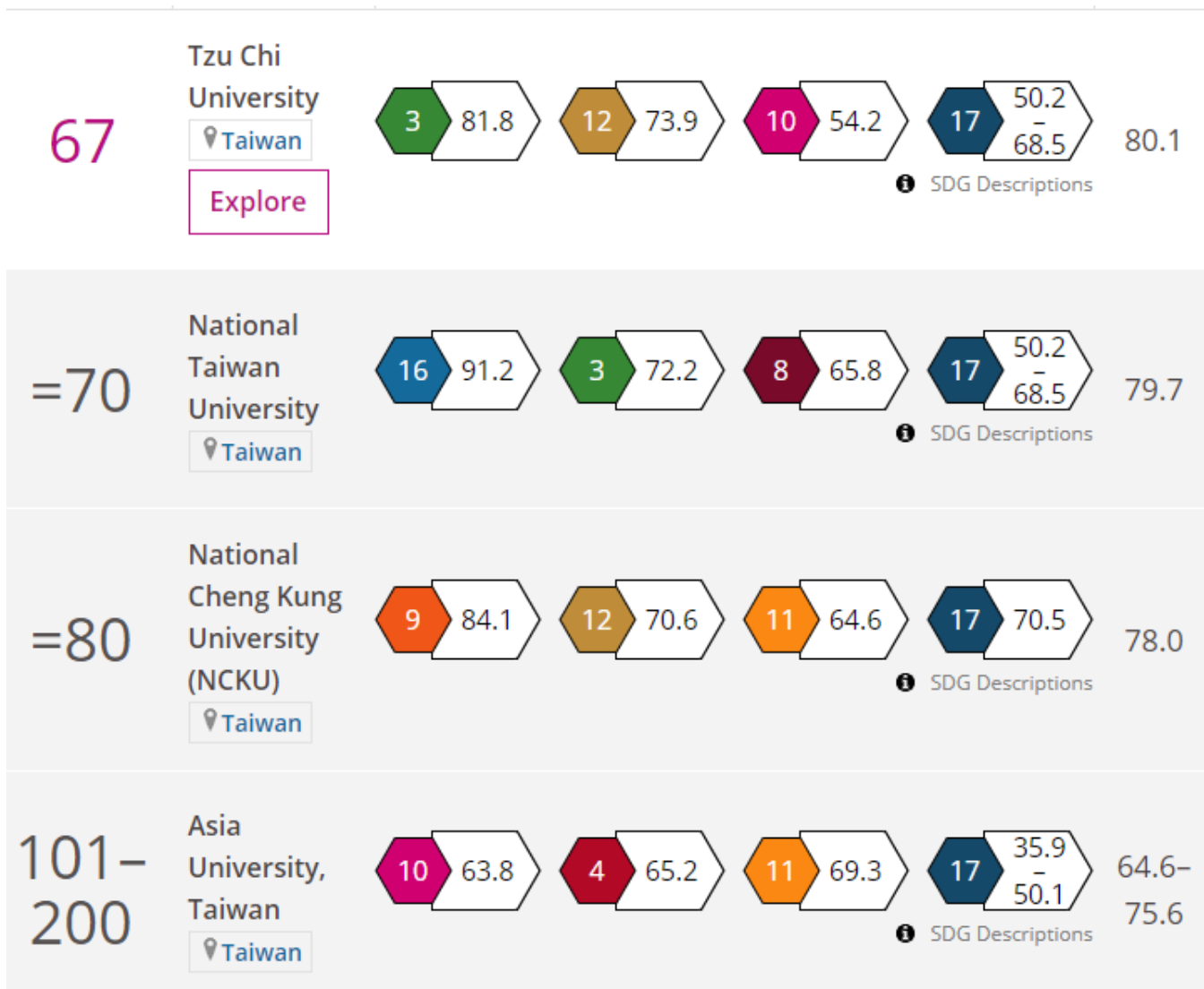
世界大學排行納入大學影響力排行

◆ 三個類目：研究(research)、推廣(outreach)、治理(stewardship)

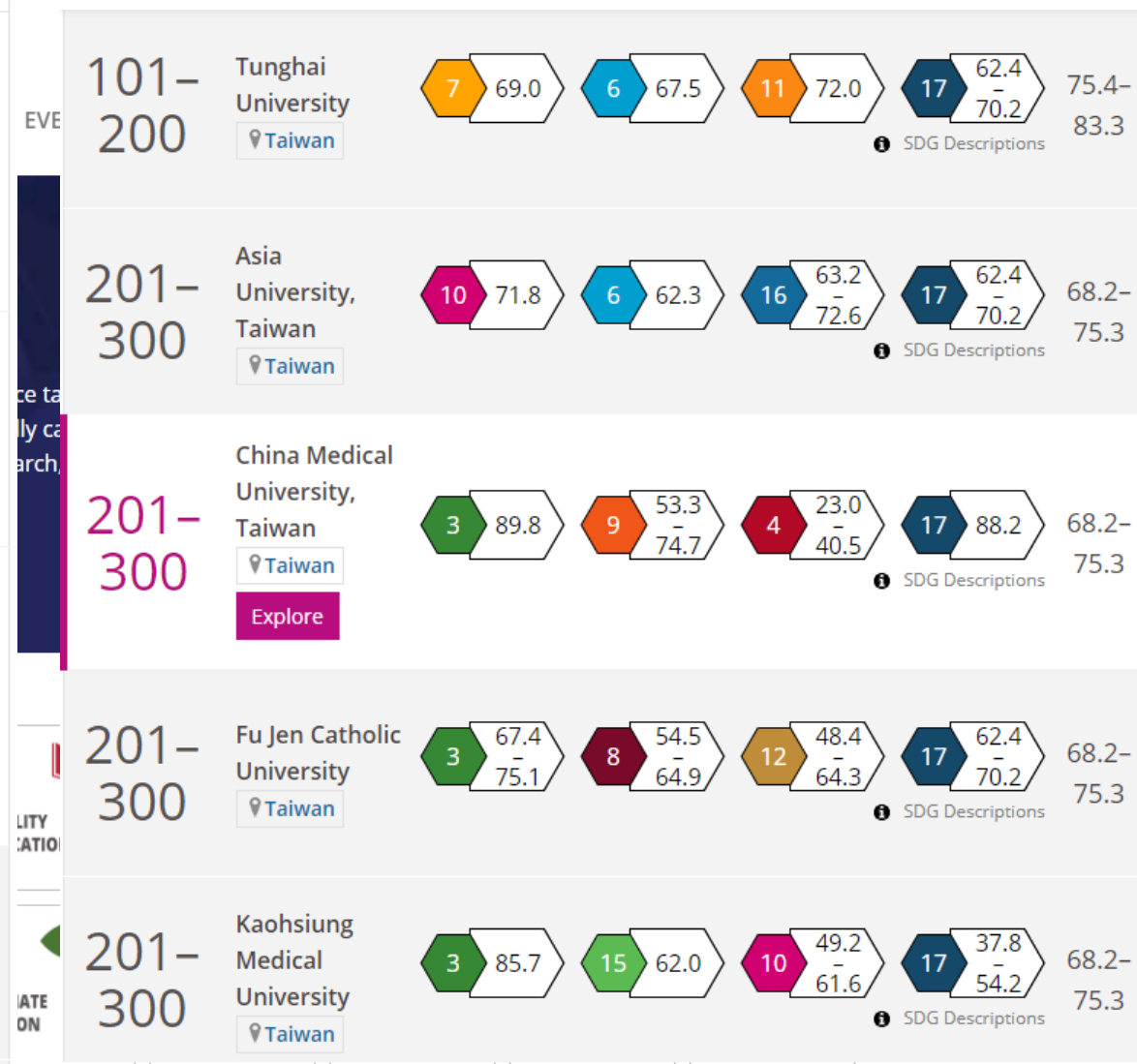
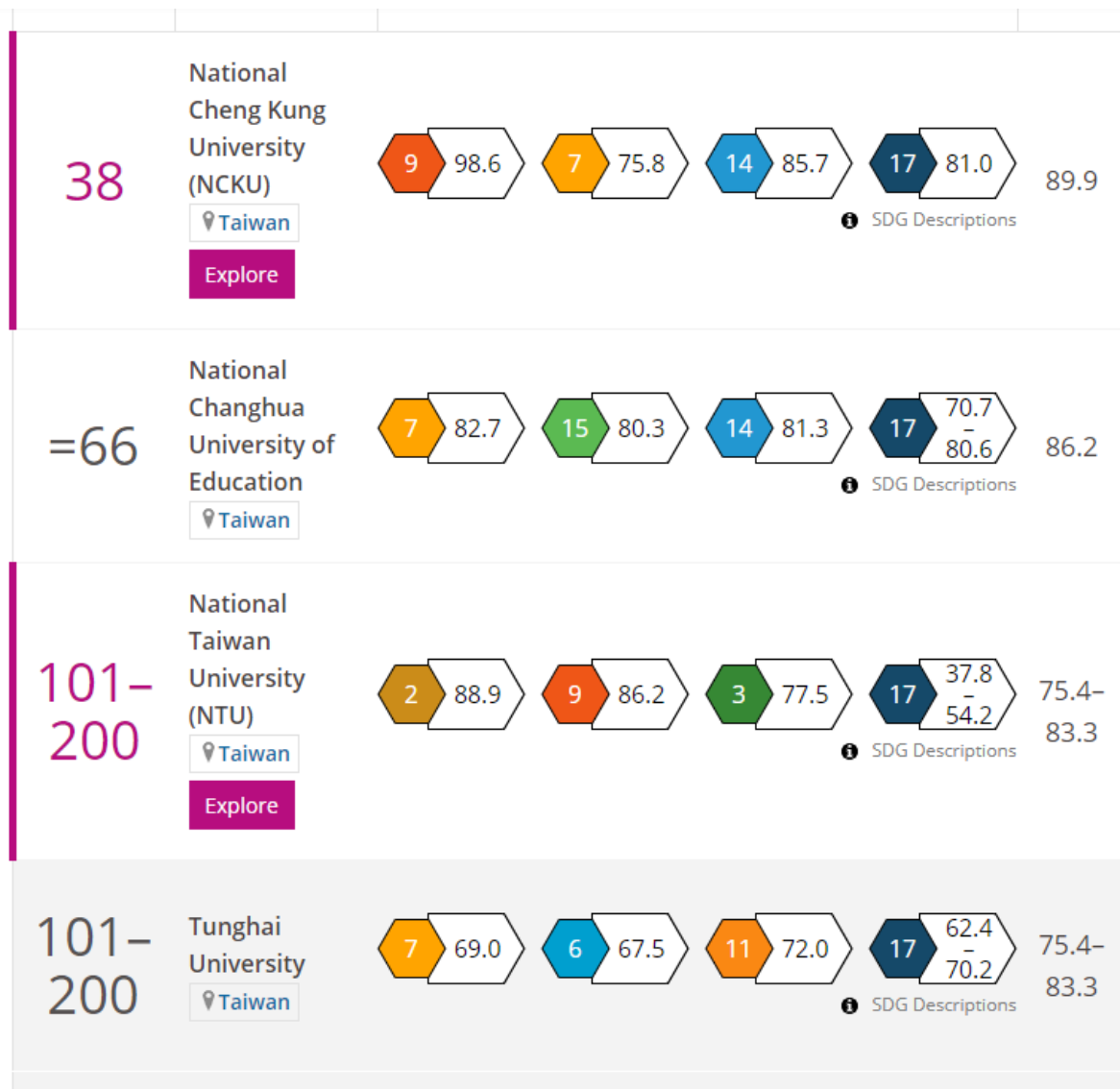
◆ 11個SDG

- SDG 3 – Good health and well-being
- SDG 4 – Quality education
- SDG 5 – Gender equality
- SDG 8 – Decent work and economic growth
- SDG 9 – Industry, innovation, and infrastructure
- SDG 10 – Reduced inequalities
- SDG 11 – Sustainable cities and communities
- SDG 12 – Responsible consumption and production
- SDG 13 – Climate action
- SDG 16 – Peace, justice and strong institutions
- SDG 17 – Partnerships for the goals

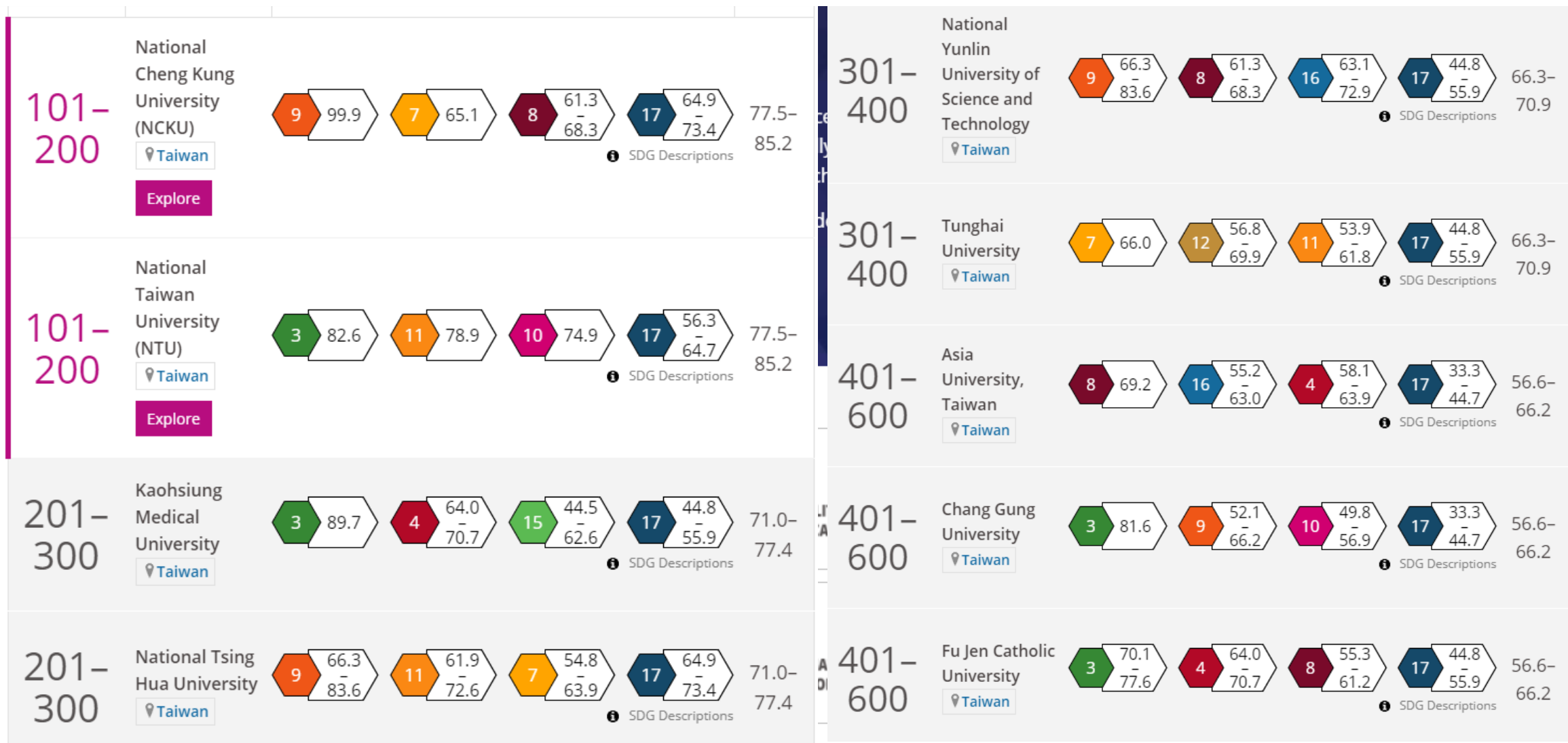
世界大學排行納入大學影響力排行



世界大學排行納入大學影響力排行



世界大學排行納入大學影響力排行



2022

世界大學排行納入大學影響力排行

=33	National Cheng Kung University (NCKU) Taiwan	201-300	National Tsing Hua University Taiwan	9	88.4	401-600	Asia University, Taiwan Taiwan	8	70.8	4	401-600	National University of Kaohsiung Taiwan	16	64.0-71.2	12	64.4-75.5	601-800	National Central University Taiwan	12	54.0-64.2	9	801-1000	Providence University Taiwan	4	49.8-58.0	11	38.9-53.3	10	48.3-54.7	17	41.5-50.1	50.3-57.2
	Explore	National Yunlin University of Science and Technology Taiwan	201-300	9	70.1-85.4	401-600	Chaoyang University of Technology Taiwan	4	62.0-67.6	8	401-600	National Sun Yat-Sen University Taiwan	9	88.1	11	53.4-60.0	601-800	National Chin-Yi University of Technology Taiwan	7	61.1-68.1	12	801-1000	Soochow University Taiwan	4	49.8-58.0	12	54.0-64.2	16	40.4-56.1	17	50.2-58.7	50.3-57.2
=37	National Taiwan University (NTU) Taiwan	201-300	Tzu Chi University Taiwan	3	90.1	401-600	China Medical University, Taiwan Taiwan	3	73.9-79.6	9	401-600	National Taipei University Taiwan	11	69.2-78.6	16	71.3-78.4	601-800	National Chung Hsing University Taiwan	11	60.1-68.9	2	801-1000	Yuan Ze University Taiwan	4	49.8-58.0	11	53.4-60.0	10	55.1-62.4	17	41.5-50.1	50.3-57.2
	Explore		National Yang Ming Chiao Tung University Taiwan	101-200	National Changhua University of Education Taiwan	16	71.3-78.4	401-600	Fu Jen Catholic University Taiwan	12	64.4-75.5	4	401-600	University of Taipei Taiwan	3	68.7-73.8	5	59.6-65.9	601-800	National United University Taiwan	7	49.6-55.1	8	1001+	Chung Hua University Taiwan	10	55.1-62.4	9	47.2-57.1	8	25.0-44.9	17
101-200	Taipei Medical University Taiwan	101-200	National Taipei University of Technology Taiwan	9	91.7	401-600	Kaohsiung Medical University Taiwan	3	91.1	12	401-600	Tzu Chi University of Science and Technology Taiwan	3	68.7-73.8	5	53.5-59.5	801-1000	Feng Chia University Taiwan	12	54.0-64.2	9	1001+	National Chiayi University Taiwan	6	38.1-47.1	13	18.7-36.4	7	3.2-29.8	17	1.6-41.4	9.2-50.2
	Explore	Tunghai University Taiwan	101-200	National Taiwan Normal University Taiwan	5	59.6-65.9	401-600	Nanhua University Taiwan	10	73.0	8	401-600	Chang Gung University Taiwan	3	81.7	9	70.1-85.4	801-1000	National Chi Nan University Taiwan	9	57.6-69.8	8	1001+	National Kaohsiung University of Science and Technology Taiwan	8	45.0-55.2	9	57.6-69.8	7	29.9-49.5	17	1.6-41.4
101-200	National Pingtung University of Science and Technology Taiwan	201-300	National Taiwan Normal University Taiwan	5	59.6-65.9	401-600	National Chung Cheng University Taiwan	12	64.4-75.5	2	601-800	Chang Jung Christian University Taiwan	8	59.6-64.6	12	54.0-64.2	801-1000	National Pingtung University Taiwan	4	62.0-67.6	8	1001+	National Taichung University of Science and Technology Taiwan	3	53.3-63.6	8	45.0-55.2	9	47.2-57.1	17	1.6-41.4	9.2-50.2
	Explore	National Dong Hwa University Taiwan	201-300	7	61.1-68.1	401-600	National Dong Hwa University Taiwan	7	61.1-68.1	15	601-800	Chung Yuan Christian University Taiwan	9	70.1-85.4	10	62.5-72.5	801-1000	National Taiwan Ocean University Taiwan	14	52.3-67.6	7	1001+	National Taipei University of Business Taiwan	10	35.7-48.2	5	28.7-39.5	4	2.9-33.6	17	1.6-41.4	9.2-50.2

◆ HESD整體目標

- Encourage **peer-to-peer learning** using IAU global network of higher education leaders
鼓勵同儕學習
- Monitor **trends**, develop and **share expertise** on the Sustainable Development Goals
分享與發展對SDGs的專長
- Foster **whole institution approaches** at the leadership level to integrate sustainable development priorities
發展全校式方法
- Provide leadership **training, capacity building and networking services**
訓練與能力建構

◆ IAU推動HESD的ABC策略

- Advocacy & Analysis
 倡議與分析
- Building Synergies & Networking
 建構協同效應與網絡
- Communicating & Convening
 溝通與合作

IAU全球HESD的SDG聚集：合作與交換資源



雪梨科技大學：研究與SDGs的融入



We're in it for the long run.

That's why the Sustainable Development Goals matter.

- No Poverty
- Zero Hunger
- Good Health and Well-being
- Quality Education
- Gender Equality
- Clean Water and Sanitation
- Affordable and Clean Energy
- Decent Work and Economic Growth
- Industry, Innovation and Infrastructure
- Reduced Inequalities
- Sustainable Cities and Communities
- Responsible Consumption and Production
- Climate Action
- Life Below Water
- Life on Land
- Peace, Justice and Strong Institutions
- Partnerships for the Goals



Decentralised Energy

Unlocking new business models and empowering communities in the transformation of our energy system.



Public Transport

Progressing a new customer-service paradigm that delivers better-integrated and equitable transport systems.



Wealth from Waste

Uncovering above-ground resources and identifying other opportunities to de-couple economic growth from resource use.



Water and Sanitation

Shaping evidence-based policy and programs to achieve water security, gender equality and sustainable service delivery.



Stanford
ENGINEERING

Center for Sustainable
Development & Global
Competitiveness

Stanford University

The Center for Sustainable Development and Global Competitiveness

- ◆ Smart city and smart infrastructure
- ◆ Cross-cultural learning, decision-making, and leadership
- ◆ Global entrepreneurial ecosystem formation for sustainable development and competitiveness
- ◆ Sustainable knowledge resources and social computing
- ◆ Global competitiveness and innovation research program
- ◆ Collaboratory for individual resilience and uncertainty management



Home > Topics >

Academics & Research

Harvard offers more than 240 courses on energy, environment, and sustainability

Harvard Speaks on Climate Change

HARVARD SPEAKS ON CLIMATE CHANGE

02:21

OUR ROADMAP

EMISSIONS AND ENERGY

- GREENHOUSE GAS EMISSIONS
- ENERGY REDUCTION
- RENEWABLE ENERGY

CAMPUS OPERATIONS

- NEW CONSTRUCTION
- BUILDING OPERATIONS
- TRANSPORTATION
- CLIMATE PREPAREDNESS AND CAMPUS RESILIENCE
- PROCUREMENT

NATURE AND ECOSYSTEMS

- LANDSCAPE OPERATIONS
- CAMPUS DESIGN
- CONSERVATION AND EDUCATION

CULTURE AND LEARNING

- RESEARCH AND TEACHING
- GOVERNANCE
- EXTERNAL PARTNERSHIPS
- COMMUNICATIONS
- COMMUNITY ACTION

HEALTH AND WELL-BEING

- PERSONAL WELL-BEING
- FOOD

<https://green.harvard.edu/topics/academics-research>



UNIVERSITY OF
OXFORD



[Our Research / True Planet](#)

[Donate](#)

True Planet





'Perhaps one of the clearest lessons coming from the pandemic is the folly of ignoring known risks. The risks of climate change are becoming daily more apparent; we cannot afford to ignore the warning signs.' Vice-Chancellor Professor Louise Richardson

**Oxford & Environmental
Sustainability**

**ONE - Oxford Networks for
the Environment**

Review

The Trends and Content of Research Related to the Sustainable Development Goals: A Systemic Review

Shin-Cheng Yeh ^{1,*} , Yi-Lin Hsieh ¹, Hui-Ching Yu ² and Yuen-Hsien Tseng ³ 

¹ Graduate Institute of Environmental Education, National Taiwan Normal University, Taipei 11677, Taiwan; 81046003s@ntnu.edu.tw

² Department of Food and Beverage Management, Cheng-Shiu University, Kaohsiung City 83347, Taiwan; k0299@gcloud.csu.edu.tw

³ Graduate Institute of Library and Information Studies, National Taiwan Normal University, Taipei 11677, Taiwan; samtseng@ntnu.edu.tw

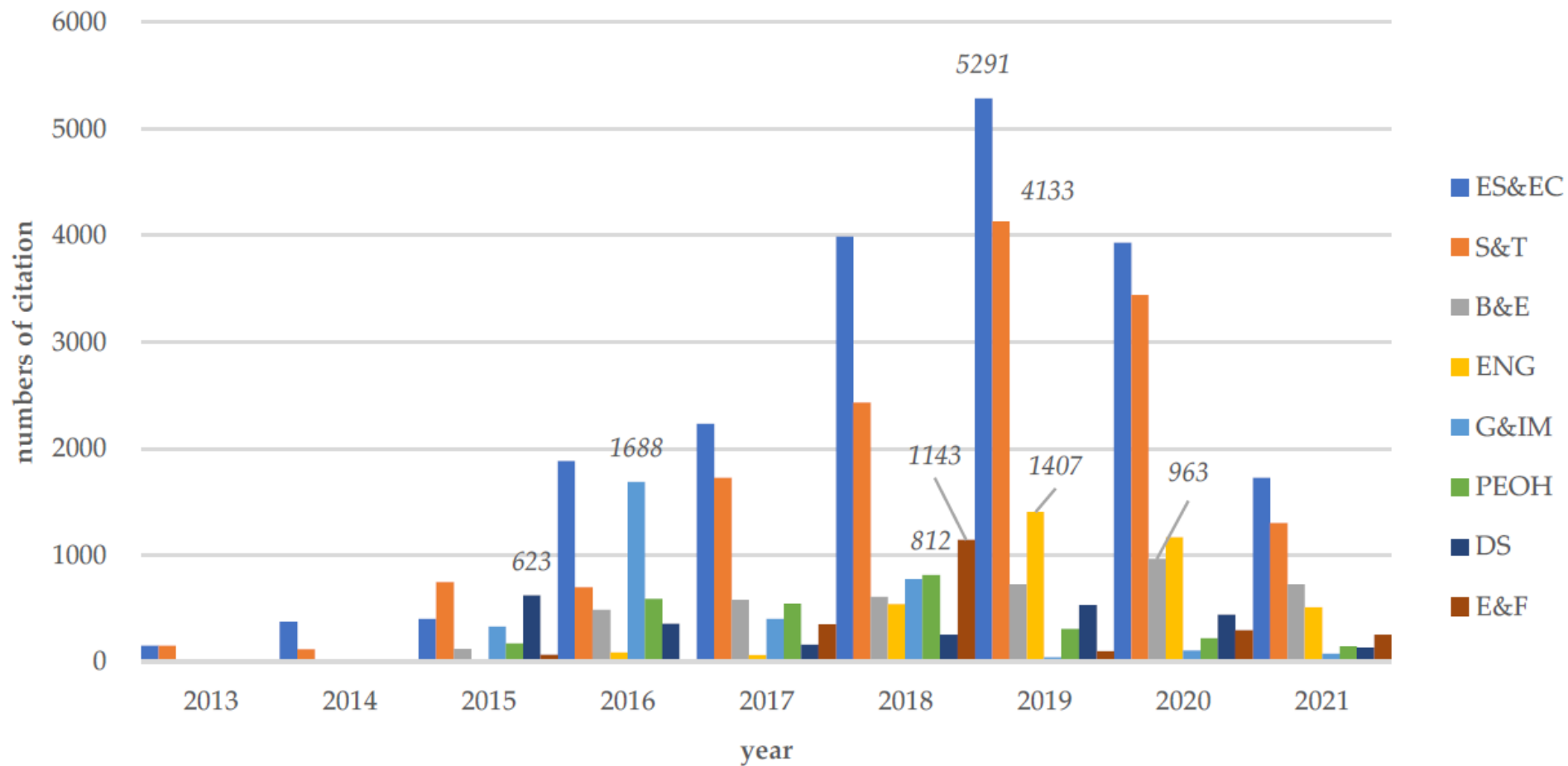
* Correspondence: scyeh@ntnu.edu.tw; Tel.: +886-2-77496563

Featured Application: Bibliometric analysis of SDG-related papers with CATAR can help academic scholars, public sectors, and practitioners utilize the growing volume of literature.

SDG相關的研究數目在各國的分佈

Year	US	UK	Spain	Australia	China	Germany	India	Netherlands
2013	1	1.2	0	0.7	0.2	1	0	0.3
2014	0.4	1	0	0.7	0	2	0	1
2015	4.1	5	0	0.5	0	1.1	1	0.4
2016	18.5	6.2	0.2	2.2	2.6	4	1.6	5.4
2017	28.9	19.7	2.5	13	1.5	7.2	2.9	6.2
2018	41.5	39.1	8	17.7	5.7	10.7	6.6	11.1
2019	47.7	49.8	19.7	22.2	20	24.7	12.8	14.3
2020	55.3	51.1	67	29.1	30.8	20.8	22.1	23.6
2021	53.9	62.5	73	38.3	52.6	23.6	29.9	16.8
2022 ¹	20.1	20.4	27.8	24.1	26.8	10.4	12.2	5
Total FC	271.4	256.1	198.2	148.4	140.1	105.6	89	84.1

¹ The numbers for 2022 covered from January to early June.



歷年與各領域相關的包括SDG的被引用的研究數目變化

ES&EC: Environmental Sciences and Ecology;
 S&T: Science and Technology;
 B&E: Business and Ecology;
 ENG: Engineering;

G&IM: General and Internal Medicine;
 PEOH: Public, Environmental, and Occupational Health;
 DS: Development Studies;
 E&F: Energy and Fuels.

各SDGs相關研究的分類群集

synergies and trade-offs

networking

critical issues, inequality, and education

water and citizen science

income and networking

systems analysis

business and institution

systems analysis

Interaction, comparison, and classification

Cooperation and resilient transformation

SDGs價值主張的具體實踐：DEI(多樣性、平等、共融)



DI·VER·SI·TY

All the ways in which people differ.



EQ·UI·TY

Fair treatment, access, opportunity, and advancement for all people. One's identity cannot predict the outcome.



IN·CLU·SION

A variety of people have power, a voice, and decision-making authority.

氣候變遷下的產業與社會轉型

◆ 虛實整合 (後疫情時代，回不去了)

- 原宇宙 + 元宇宙 = 真實宇宙，虛擬與現實的界限模糊！
- 看不見的二氧化碳轉換為實質的成本或收益

◆ 價值主張 (ESG具體而微)

- ESG = EG + SG，E與S與價值相關，主張的精準度關乎「關懷vs.漂綠」

◆ 系統更新 (革命性的系統重置)

- 系統的界定與定義能夠形成藍海，使用全新的取徑解決老問題

◆ 數位深化 (數位協助永續轉型)

- 數位轉型 + 綠色 (永續) 轉型 = 全面轉型

◆ 循環經濟 (各級各類產業的LCA)

- 422，系統思考 + 批判思考建構永續的商業模式

