

Smart Solutions for a Brighter Tomorrow

Complementary Opportunities for Collaboration between Spain and Taiwan



Smart Cities Consulting

跨學科研究發展、跨域結合、執行政策、策略和技術

永續發展城市競爭力

Taiwan Smart Solutions Association CIECA-Taiwan Smart Cities Committee

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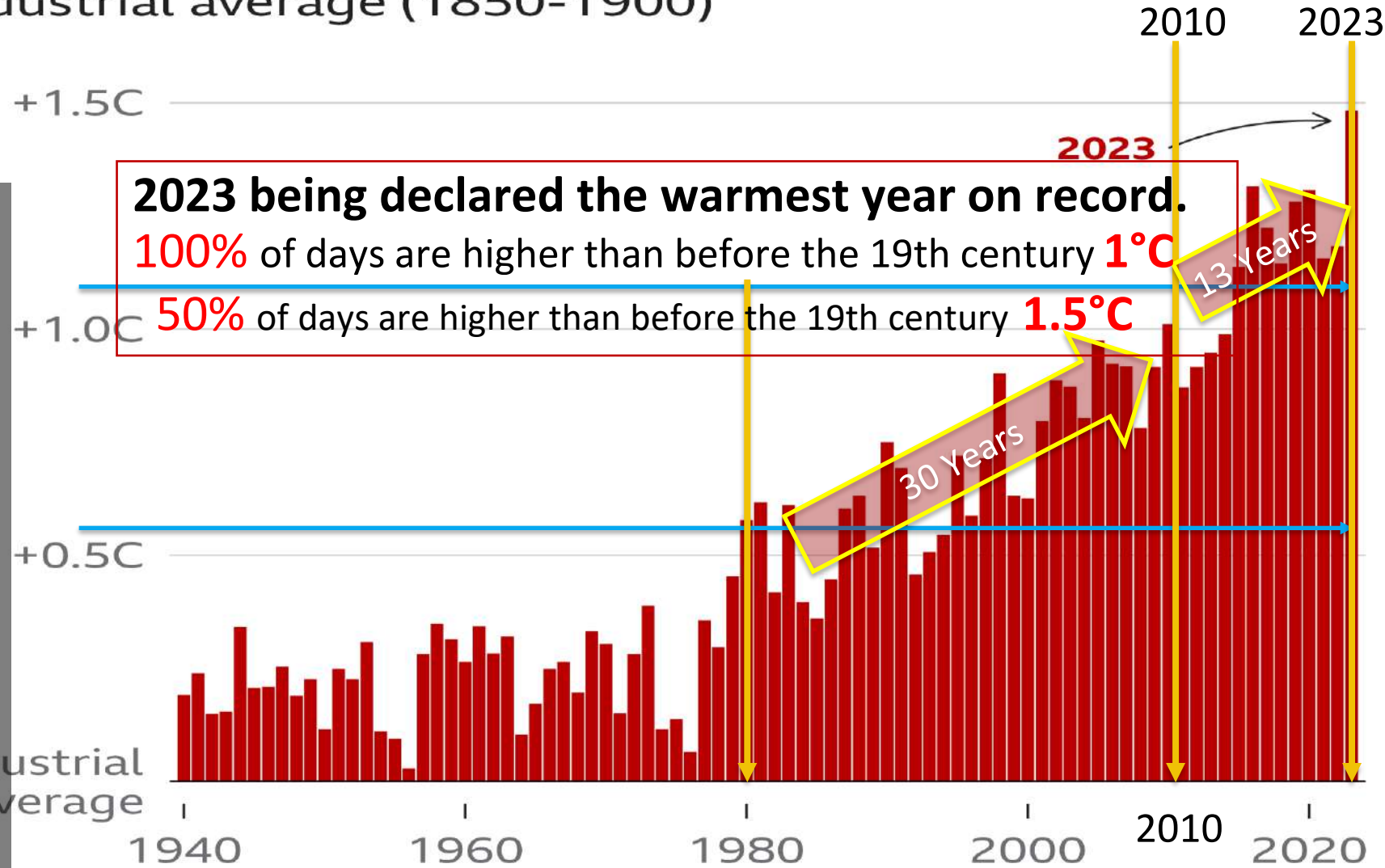
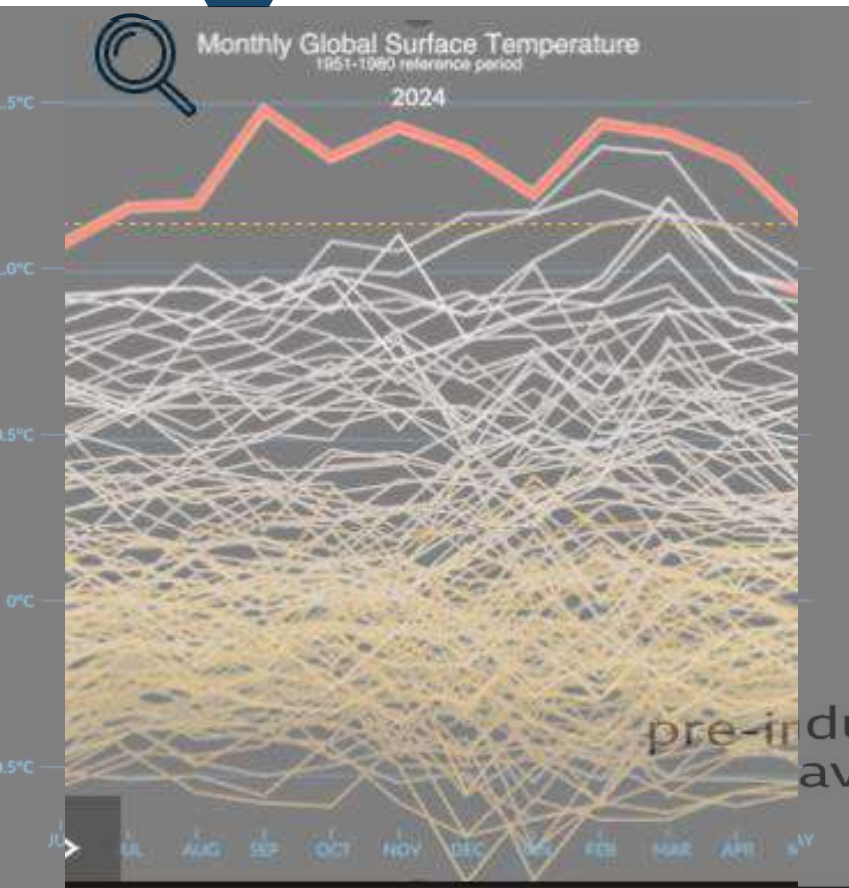
November, 2024





Hottest year on record

Global average temperature by year, compared with pre-industrial average (1850-1900)



2023 being declared the warmest year on record.

100% of days are higher than before the 19th century **1°C**

50% of days are higher than before the 19th century **1.5°C**



Impact of climate change

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✓ COP28 Climate Change Conference of the Parties

(2023/12/13, 150 heads of state and government. Provide financial and technical support to decide how to accelerate action in all areas by 2030)

2024/04/17 flooding in Dubai

2023-11-24 heavy storm in Dubai



Dubai flooded,
residents use rubber boats



Rare rainstorm in desert

European Sustainability Reporting Standards (ESRS)

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- In 2015, the United Nations approved the 2030 Agenda for sustainable development (United Nations Global Compact, [2018](#)), establishing **17 SDGs** (sustainable development goals).
- Through Spain Law 11/2018 (Le, [2018](#)), corporate **sustainability reports** must be analyzed to identify and define companies' economic and sustainability models, as well as their commitment to the SDGs.
- Sustainability reporting (**ESG**) and global reporting initiative (**GRI**) standards are “drivers” in meeting the SDGs.
- In December 2022, **Directive (EU, [2022](#)) 2022/2464** of the **European Parliament** and of the Council on **sustainability reporting** was approved.
- The **European Financial Reporting Advisory Group** also approved updated versions of the **European Sustainability Reporting Standards (ESRS)**, which will become mandatory starting in early 2024.

Spain statutes relating to the environment



Spain statutes relating to the environment, which mainly focus on the energy transition, include:

- Law 26/2007 on environmental responsibility;
- Law 22/2011 on waste and contaminated soil;
- Royal Decree 564/2017 on the certification of **energy efficiency in buildings**;
- Royal Decree 617/2017 on alternative energy vehicles;
- Royal Decree-Law 15/2018 on urgent measures for **energy transition** and consumer protection; and
- Law 7/2021 on **climate change and the energy transition**.



Achieving Net Zero Emissions



No ESG, No Money How should 99% of SMEs in Spain (90% Globally) address ESG ?

- Amid multiple challenges such as **globalization**, the **epidemic**, and **climate change**, **ESG** and **net-zero carbon reduction** have become major trends in the international market. As effective tools to address these challenges, **carbon inventory** and **smart solutions** have become a rigid demand for enterprises and governments.

Act

Carbon inventory,
Carbon emissions,
monitoring and
management

Engage

Energy transition, Digital
transformation, **Low carbon
technology,** Green infrastructure,
Employee training,
International cooperation

Achieve

**Carbon
neutral,**
Net zero
carbon
emissions



Four Steps to ESG Industrial Upgrading



Carbon Anxiety and how to deal with it The Last Mile to Net Zero

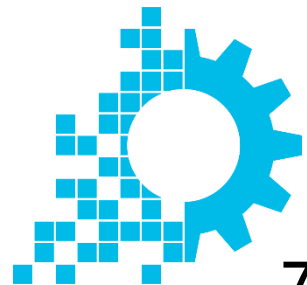
Rapid carbon
inventory

Planned
carbon
reduction

Optimization
with Smart
Solutions

New materials,
New processes,
New construction
Methods

Taiwan smart solutions can help the government and enterprises **improve energy efficiency, reduce carbon emissions, develop green products and innovation**, thereby enhancing their competitiveness in the international market while achieving the goal of **sustainable development**.



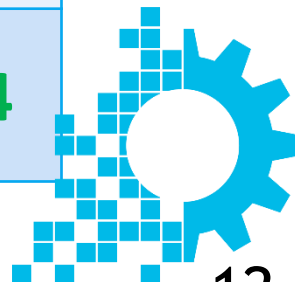
Basic Data: Spain vs. Taiwan



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	Spain	Taiwan	Ratio
Area	505,990 km ² (51 st)	36,197 km ²	14:1
Population	48,797,875 (31 st)	23,894,394 (56 th)	2:1
Density	96/km ² (249/mi ²) (121 st)	650/km ² (1,683/mi ²) (17 th)	1:6.8
<u>GDP (PPP)</u> Total	<u>\$</u> 2.67 trillion(15 th)	\$1.69 trillion(20 th)	1.6:1
<u>GDP (PPP)</u> per capita	\$55,089 (36 th)	\$72,485 (15 th)	1:1.4



2020-2024 World Competitiveness Ranking (Taiwan/Spain)

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Overall	2020	2021	2022	2023	2024
	16/36	11/39	08/36	07/36	06/40

2020-2024 World Digital Competitiveness Ranking (Taiwan/Spain)

Overall	2020	2021	2022	2023	2024
	11/33	08/31	11/28	09/31	09/28
Technology	05/33	02/31	06/33	03/31	07/31
Future Readiness	08/40	07/35	08/37	07/29	06/29

2024 IMD Smart City Index (Taipei 16 / Barcelona 81 / Bilbao 29 / Madrid 35 / Zaragoza 57)

Top 10 Taiwan Export Products



- 1. Integrated Circuits** (HS Code: 8542) – Backbone of global electronics.
- 2. Semiconductor Devices** (HS Code: 8541) – Crucial for various tech applications.
- 3. Plastics** (HS Code: 3907) – Versatile materials for multiple industries.
- 4. Petrochemicals** (HS Code: 2902) – Base for industrial processes.
- 5. Automobile Parts** (HS Code: 8708) – High precision and quality.
- 6. Optical Instruments** (HS Code: 9001) – Advanced technologies for various sectors.
- 7. Steel Products** (HS Code: 7204) – Essential for construction and manufacturing.
- 8. Footwear** (HS Code: 6403) – Diverse range and styles.
- 9. Bicycles** (HS Code: 8712) – Renowned for their innovation and design.
- 10. Textiles** (HS Code: 5407) – High-quality fabric production.

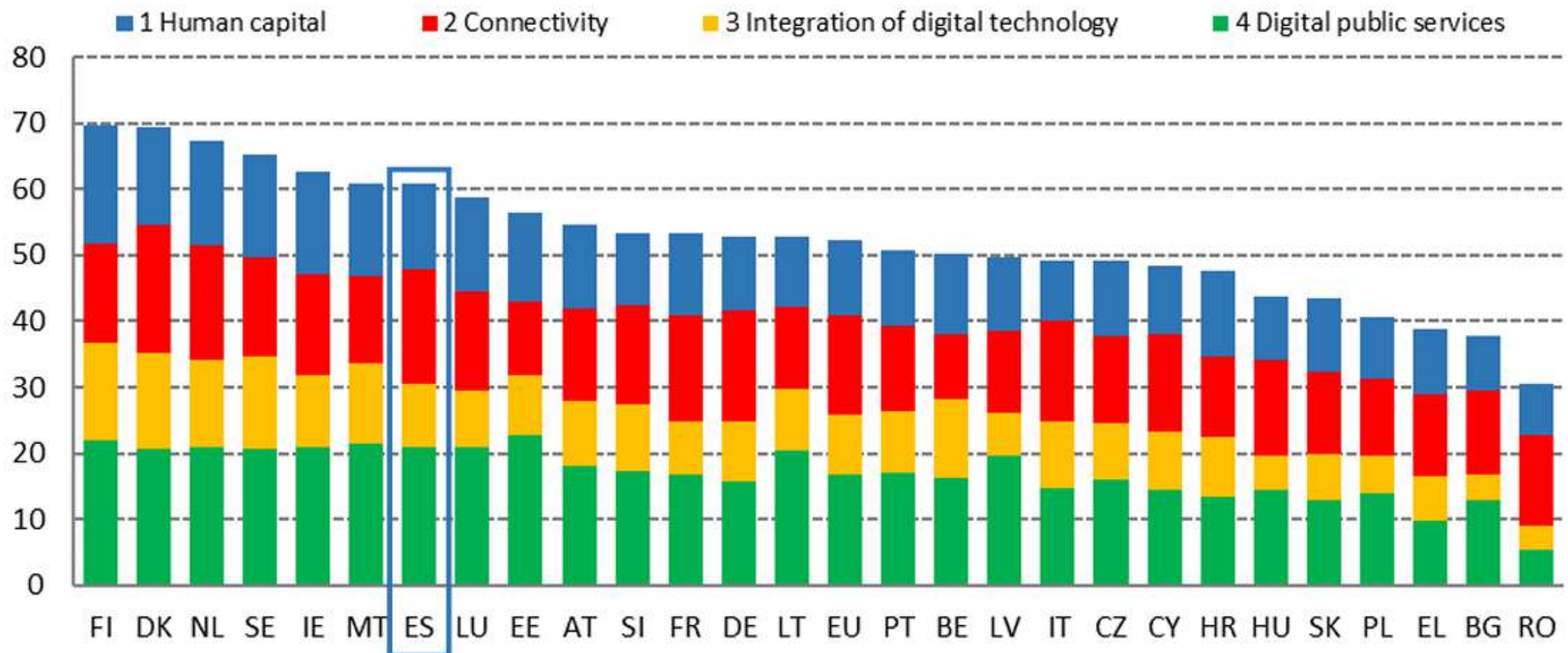




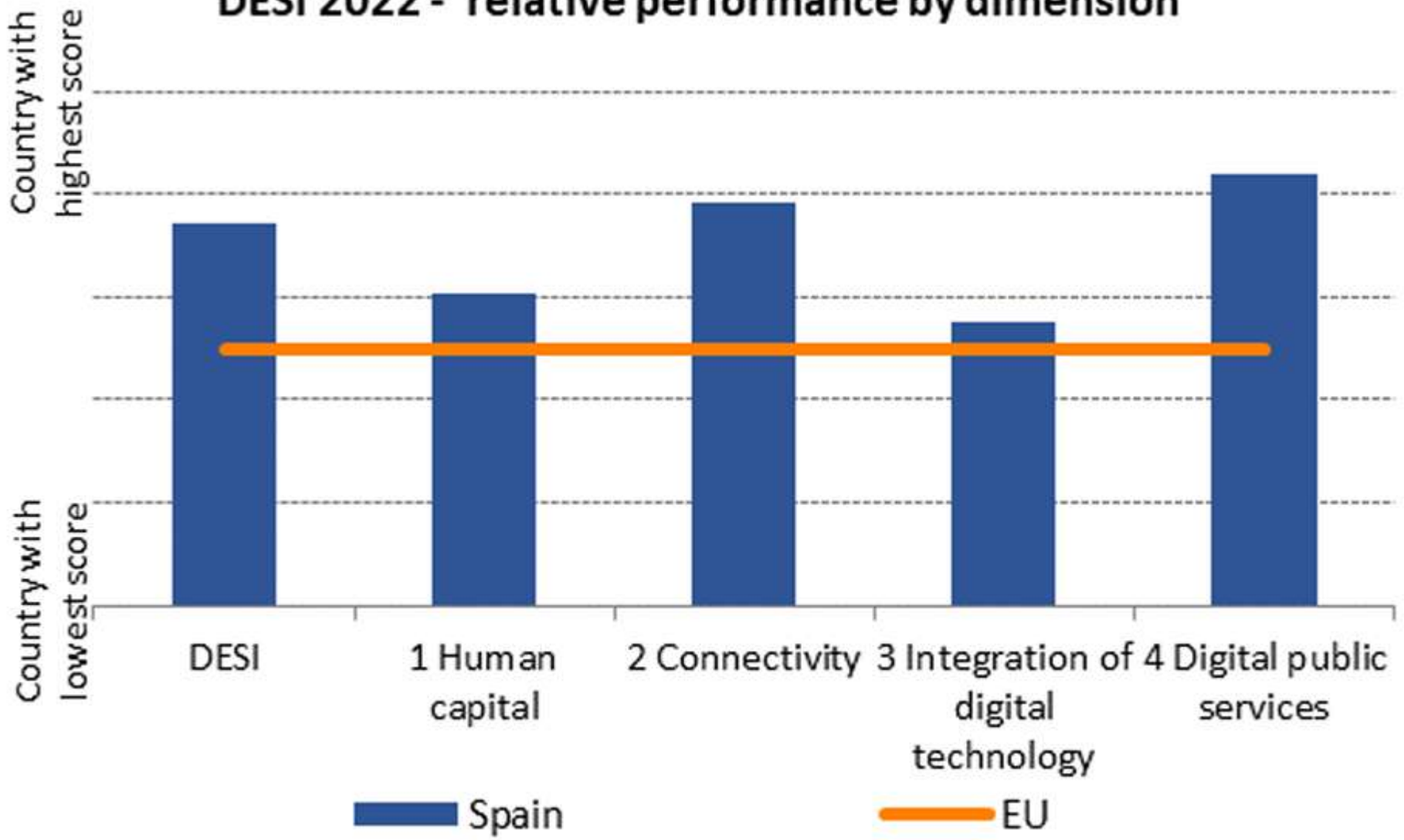
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	Spain		EU
	rank	score	score
DESI 2022	7	60.8	52.3

Digital Economy and Society Index (DESI) 2022 ranking



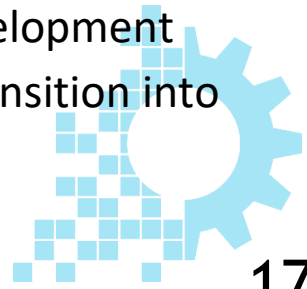
DESI 2022 - relative performance by dimension





Asturias pushes towards renewable energy integration and green industrial processes .

- With over 1 million population, Asturias is **a natural paradise**—home to rugged coasts and mountains.
- **Economy:** Asturias has shown steady growth, with a GDP increase of 2.2% in 2023, slightly lower than Spain's overall growth.
 - ✓ This region contributes to the Spanish economy through traditional industries but has also been diversifying toward **renewable energy, technology manufacturing** and **Energy**
 - ✓ The region is a significant player in Spain’s industrial sector, especially in **energy production**. This strong energy base, historically rooted in heavy industry, supports Asturias’ push towards **renewable energy integration and green industrial processes** .
- **STEM Talents:** Although Asturias is not a primary tech hub compared to Madrid or Barcelona, it is increasingly emphasizing STEAM (Science, Technology, Engineering, Arts, and Mathematics) careers to support industrial and economic transformation. This emphasis is essential to meet local development needs, especially in emerging sectors like **green tech**. Asturias is lets industrial history to transition into **sustainable energy** and **advanced manufacturing**.



Rising with the trend with New Opportunities

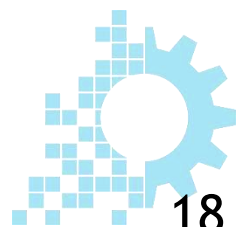
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- **99%** of enterprises in Taiwan are SMEs.
- In Spain, SMEs account for **99%** of active businesses, or about **2.8 million** in total, considerably higher than the EU average of **67%**. SMEs generate **61%** of the country's value added and employ **72%** of the Spanish workforce.



opportunities



Rising with the trend with New Opportunities

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A Critical Step to Unlocking Manufacturing Potential

In the digital age, the manufacturing industry cannot ignore the importance of digital transformation. **Data analysis, Internet of Things, artificial intelligence, digital twins,** and other technologies will redefine **production processes** and **business models**. Through digitization, the manufacturing industry can **realize real-time monitoring, smart manufacturing,** and improve production **efficiency** and **quality**.

At the same time, digital transformation has also opened new **blue ocean opportunities for enterprises.**



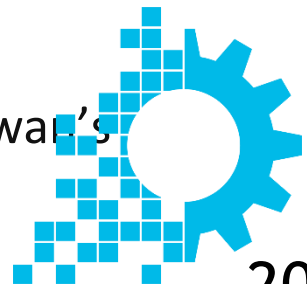
Complementary Opportunities between Spain and Taiwan

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- **How Taiwan can help Asturias, Spain** to achieve Digital Technologies Industry Transformation Plan:

- ✓ **Collaboration:** Taiwan's expertise in technology and innovation could foster collaboration between the two nations. Joint research, knowledge sharing, and partnerships could accelerate Spain digital transformation efforts.
- ✓ **Learning from Best Practices:** Spain can learn from Taiwan's successful strategies in areas such as e-governance, digital education, and fostering a vibrant tech ecosystem.
- ✓ **Investment Opportunities:** Taiwan's thriving tech industry presents investment opportunities for Spain companies seeking to expand their digital footprint.
- ✓ **Talent Exchange:** Exchange programs and talent mobility can facilitate knowledge transfer and skill development.
- ✓ **Benchmarking:** Spain can benchmark its digital policies against Taiwan's best practices to identify areas for improvement.



Complementary Opportunities between Asturias and Taiwan

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A collaboration between Asturias and Taiwan in **ESG, deep energy-saving**, and **smart solutions** could leverage the strengths of both regions in technology, innovation, and sustainability. Here are a few areas to consider:

- 1. Renewable Energy and Green Technology:** Asturias has a history of heavy industry but is transitioning toward renewable energy. Taiwan's advanced technology in solar power, offshore wind, and smart grid systems could complement Asturias' energy goals. Joint projects could focus on expanding renewable infrastructure and integrating energy storage solutions to improve efficiency.
- 2. Smart City Solutions:** Both regions could share expertise in developing smart cities with a focus on sustainability. Taiwan has made strides in **IoT, 5G**, and **AI-driven urban management**, which could be applied to enhance Asturias' urban planning. This collaboration could involve co-developing intelligent transportation systems, waste management, and **energy-efficient buildings**.

Complementary Opportunities between Asturias and Taiwan

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- 1. ESG Strategies for Industrial Transition:** Asturias, with its industrial past, might benefit from Taiwan's experience in **carbon-neutral industrial processes** and **ESG-driven corporate governance**. The collaboration could involve knowledge exchange in **green manufacturing**, **circular economy** principles, and **sustainable supply chains**.
- 2. Deep Energy-Saving Technologies:** Taiwan's expertise in **smart grids**, **energy management systems**, and **efficient energy use in manufacturing** could be vital for **Asturias' energy-saving goals**. Joint initiatives could focus on reducing energy consumption in industries, buildings, and transportation.
- 3. Academic and Research Collaboration:** Partnering academic institutions in Asturias and Taiwan could drive joint research in energy efficiency, carbon capture, and ESG policies. Taiwan's universities and research centers have developed innovative climate technologies, which could be beneficial for Asturias' green transition.

Facilitating a **platform for cross-regional discussions** through forums, business delegations, and research exchanges could strengthen these areas of collaboration.

Complementary Opportunities between Asturias and Taiwan

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Dual Transformation



Digital Transformation

Green Transformation



- Automation
- Big Data
- Cybersecurity Cloud
- Digital Twin
Deep Energy Saving
- Edge Computing
- 5G Network
- Generative AI

ISO 14064 Organization
Carbon Inventory

ISO 14067 Product Carbon
Footprint

ISO 50001 Energy
Management

ISO 14068 Carbon
Neutrality, Energy Saving,
and Energy Creation

ESG Report



Taiwan Smart Solutions

Use smart diagnosis to connect smart cities through IoE solutions



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Digital & Green Dual Transformation

A, B, C, D, E, F, G for the future

Please refer to the [Appendix List of Taiwan Smart Solutions.pdf](#) for details.

key components



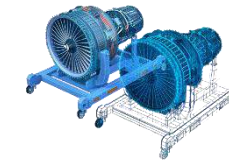
Automation

Big Data



Cybersecurity
Cloud

Digital Twin
Deep Energy Saving



Edge Computing

5G Network



Generative AI



Taiwan Smart Solutions

Use smart diagnosis to connect smart cities through IoE solutions

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1. Taiwan Smart Solutions Can Help

2. A Critical Step to Unlocking Manufacturing Potential

Digital Transformation of Manufacturing SMEs

3. Smart Factory War Room

4. Smart Clamp Sensor: Carbon footprint data collection, management and analysis

5. Digital Twin Applications

6. Taipei Underground 3D Road Pipeline & Information Center

7. Digital Twins as a Service (DTaaS), Drone as a Service (DaaS)

8. Earthquake Disaster Management

9. Airport Digital Twin

10. High Precision 3D City Model Building

11. Benefits of Taiwan Digital Twin Solutions

12. Autonomous Robot as a Service (ARaaS): intelligent gas detection and inspection vehicle

13. Farmers as a Service (FaaS)

14. Reality Virtual Reality: **Global Expert Support**

15. New Generation DC Charger: Validation by Top-Tier Global Clients

16. Zero Emission E-Bus

17. BRPV: Green Intelligent Power Generation Building Materials

18. Smart Energy (Deep-Energy Saving)

19. Smart Water

20. Smart Mobility

21. Smart Grid Solution

22. AI-ESG Smart Training Center

23. Glocalization: Taiwan Inside Smart Solutions

24. AI-ESG SmartPro Services

25. AI-Based Carbon Monitoring Software



Please refer to the [Appendix List of Taiwan Smart Solutions.pdf](#) for details.



Smart Solutions For a Better Future

Reimagining Our Cities to be Smarter and More Sustainable



Present

- President of Taiwan Smart Solutions Association
- Advisor of World Bank & European Bank for Reconstruction and Development (EBRD)
- Executive Board Director of CIESA-Taiwan
Chairman of Smart Cities Committee & Taiwan-Estonia Committee

Professional

- Fellow of the European Carbon Offset Tokenization Association
- MoEA AI Coach Certificate
- MoEA ESG Report Writing Practical Training Course Certificate
- ISO 14067 Product Carbon Footprint Lead Verifier/AFNOR
- ISO 14064-1 Greenhouse Gas Inventory Lead Verifier/AFNOR
- ISO 14068-1 Carbon Neutrality Lead Verifier/Bureau Veritas

Honors

- 2006 "US Biennial Transportation Planning Excellence Award", USDOT/American Planning Association (APA)
- 2006 "US National Award for Outstanding Individual Leadership", Association of Metropolitan Planning Organization (AMPO)

Served

- Chairman, ICT Council of Asia-Pacific Chamber of Commerce and Industry
- Member of Taipei City Smart City Committee
- Member of Taipei City Urban Development Committee
- Chairman, Technical Committee, American Asso of Metro Planning Org
- Director of R&D and Technology, New York Metro Transp Council
- Member of ASTM Int'l Standards Org ITS Archived Data User Services Committee
- Adjunct lecturer, Civil Engineering, NYU School of Engineering
- Chief Strategy Officer, CSI Software Technology Company
- Asia Region Director of French software company "City Lab"

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