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11th ADB International Education and Skills Forum

Applying a Fresh Lens to Unlock the Power of Human Capital

3-5 December 2025 | Metro Manila, Philippines



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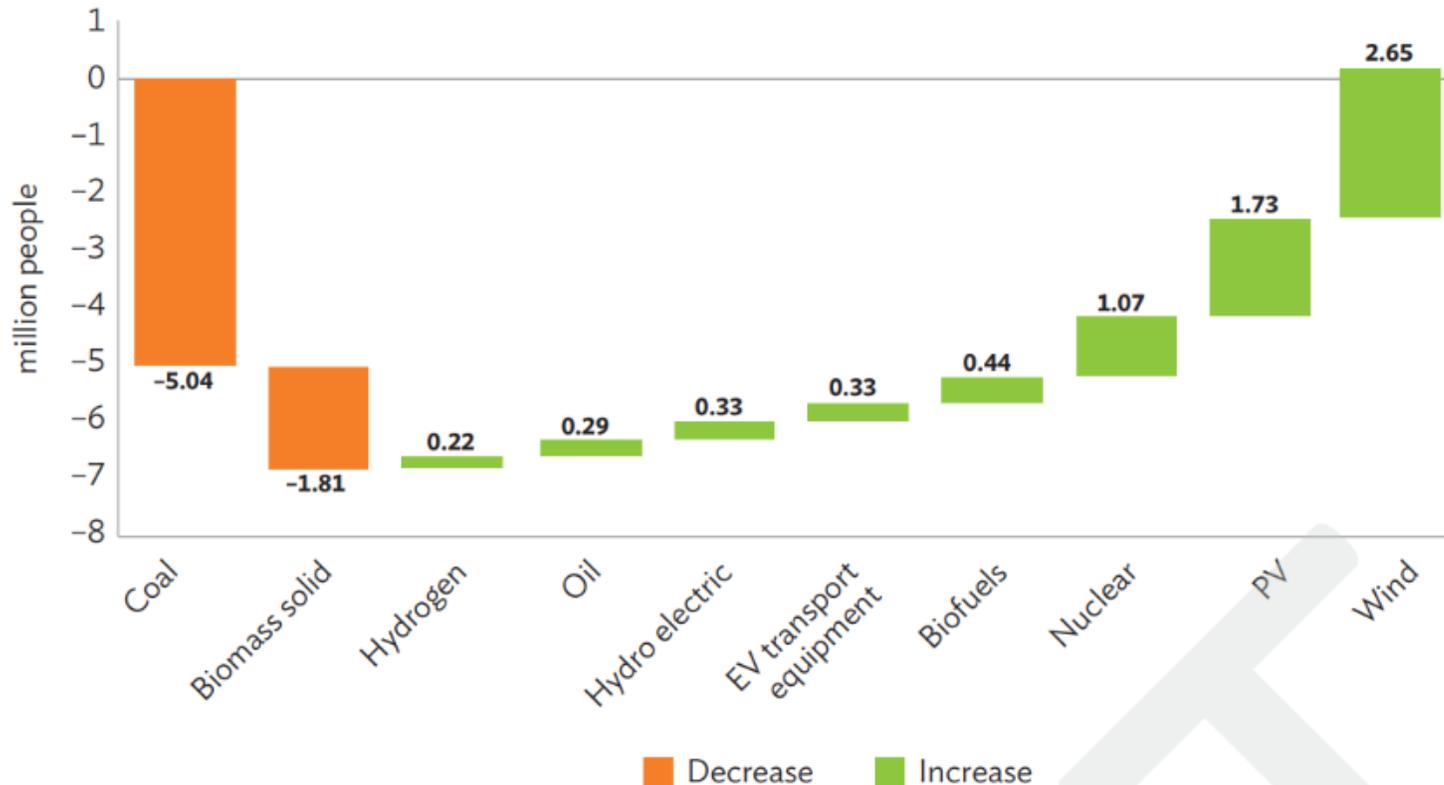
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What is changing? Large Sectoral Reallocation

Figure 4.4: Employment in the Energy Sector in the Net Zero High-Growth Scenario

(change from the Current Policies scenario)



- Temporary unemployment will rise as workers adjust and skills take time to transfer;
- Managing reallocation—not one-for-one green job replacement—is the real challenge



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Scaling National to Regional programmes requires developing a robust ecosystem that links talent development with real market needs

**24 / 25
Impact**

44 Green Job events

29,175 Green Job opportunities



Malaysian Green Technology and Climate Change Corporation

Demand for MGTC's Energy related professional training increased ~3x when the ecosystem is complete

- Registered Energy Manager
- Certified Energy Manager
- Certified Energy Auditor

Global Energy Employment – 2023 Highlights

+2.5 million new jobs;
total energy
employment >67
million

Sector job growth
(3.8%) exceeded global
average (2.2%)

Driven by record
investment post-
energy crisis

Clean energy: +1.5
million jobs; Fossil
fuels: +940,000

Clean energy
employment up 4.6%
across all segments

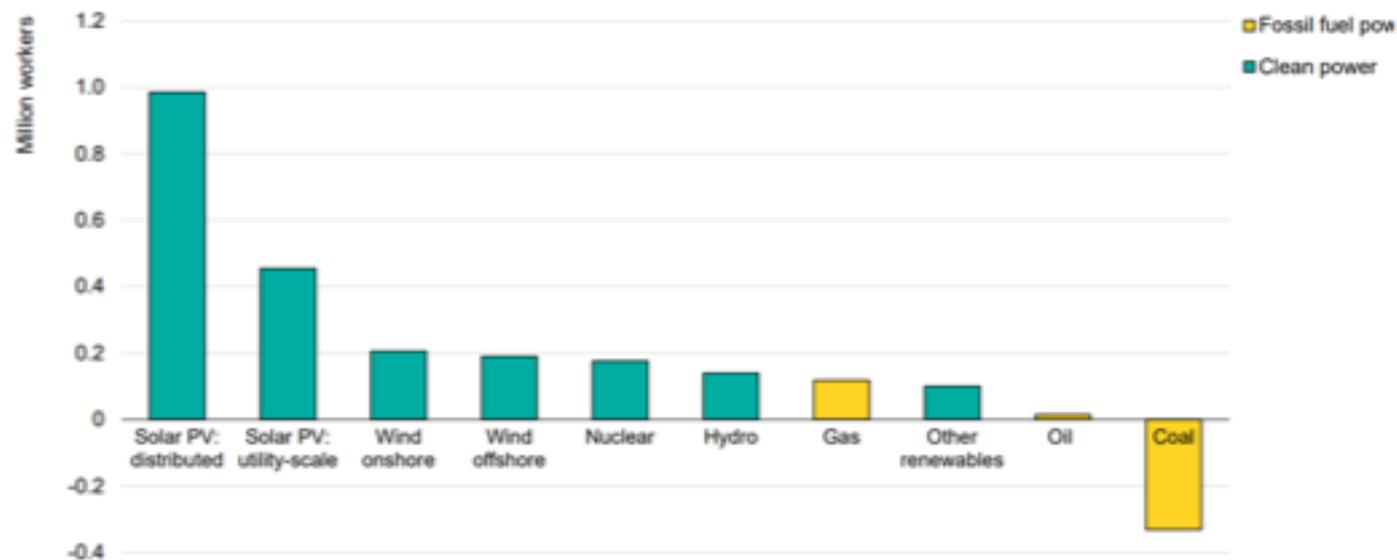
Solar PV: +500,000
jobs; strongest driver of
growth

EVs & batteries:
+410,000 jobs despite
cost pressures and
competition

Growth limited by
shortages of
specialised skilled
workers, especially in
grid and nuclear sectors

Clean energy employment in power generation added over 2.2 million jobs since 2019, while the fossil fuel workforce decreased by 6% over the same period

Employment change in power generation by technology, 2019-2023



IEA, CC BY

Energy Sector

Women make up only 15% of the global energy workforce

Representation by Sector



Asia Pacific – Solar Energy



- Women account for 40% of the workforce
- 50% in administrative roles
- 30% in management roles
- 80% of global solar PV jobs are located in Asia Pacific

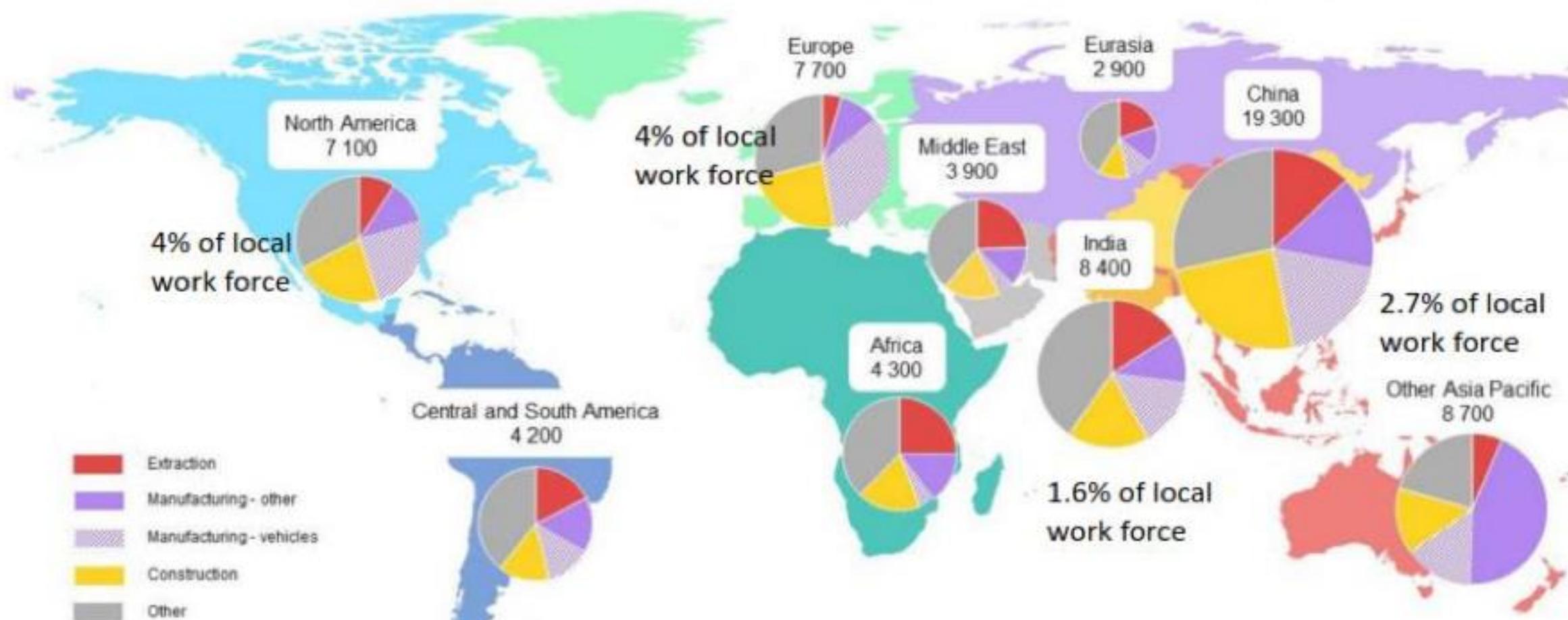
Asia Pacific – Wind Energy



- Women represent 15% (below global average of 21%)
- 12% in administrative roles
- 10% in management roles

Asia hosts the world's largest energy workforce owing to its substantial population, lower labour costs, brisk investment and sizable clean energy manufacturing sectors

Energy employment by economic activity and by region, 2022 (thousand workers) ~67,000 world



Other includes utilities, energy services professionals, and other jobs in wholesale trade and transport sectors.

Generation, transmission, distribution (20M), efficiency (10M)



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● Chongqing is located in the upper reaches of the Yangtze River and is China's fourth municipality directly under the Central Government. It covers an area of 82,400 square kilometers with a total population of 31.9 million, of which 72% are urban residents. The per capita GDP in 2024 was 14,180 US dollars.

● In recent years, Chongqing's secondary industry has accounted for approximately 40-45% of its GDP, with a relatively high proportion of manufacturing and industry. Although it is transitioning to an innovation-driven economy, there is still a gap compared with first-tier cities in China's eastern coastal regions in terms of innovation investment, patent output, and talent aggregation.

The project will (i) help the people in Chongqing gain industry-relevant and innovation oriented skills and capacities for employment; and (ii) support institutions to create an enabling and inclusive environment that helps build an innovative, diversified, efficient, and green economy in Chongqing.





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Chongqing Innovation and Human Capital Development Project

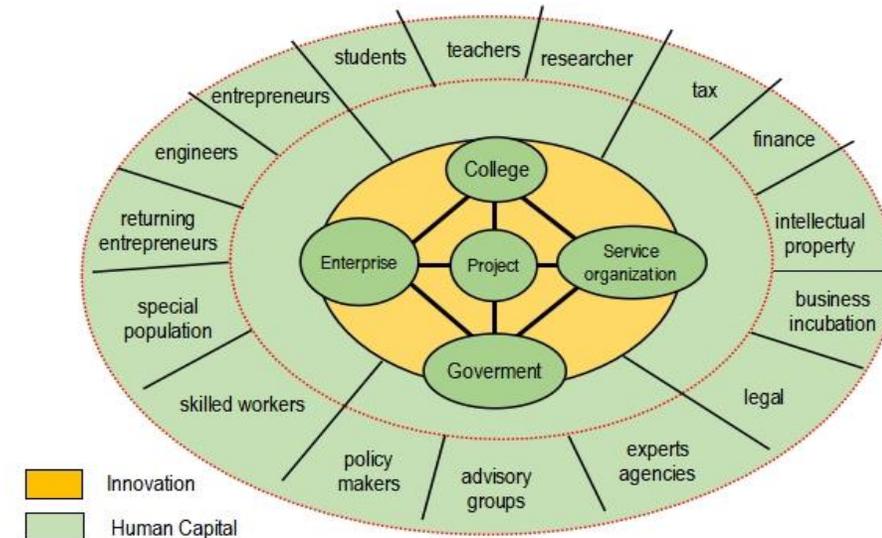
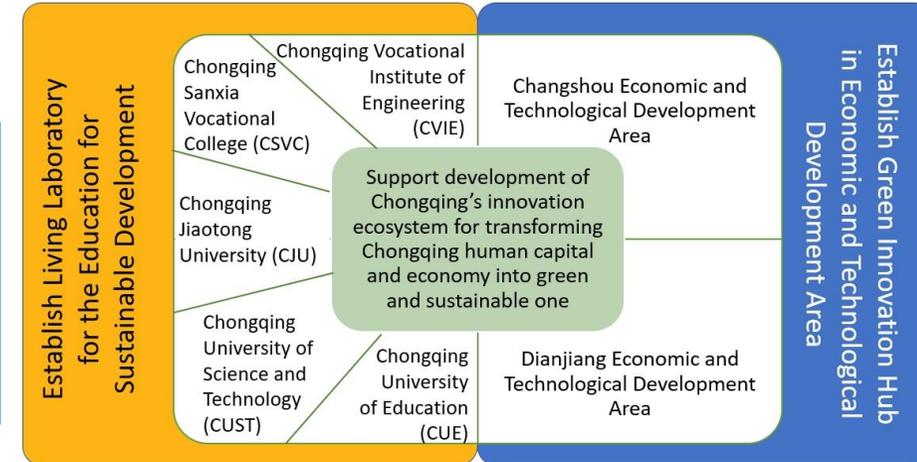
- Strengthen the relevance and quality of higher education and vocational training
- Establish innovation and entrepreneurship support mechanisms
- Enhance institutional and project management capabilities

- At least 8,000 graduates (at least 25% female) of new or upgraded programs employed within Chongqing relating to the strategic emerging industries
- At least 600 technical personnel (at least 25% of whom are female) from enterprises and research and development institutions in Changshou and Dianjiang Economic Development Zones have improved their employment and entrepreneurship skills

The total investment of the CQUST subproject is approximately \$55.50 million, accounting for 14.65% of the total investment of the Chongqing project.

The project executing agency is the Chongqing Municipal People's Government. The seven project implementing agencies are shown in the figure on the right.

Innovations of the Chongqing Project:
Inclusive innovation ecosystem
Green and people-oriented building design
Application of Building Information Modeling (BIM) in the project
Open to public as living laboratories for education on sustainable development





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Integrate the training of safety-related scientific and technological talents, technological innovation (scientific research), and technical services to build an industry-education integration model **driven by both a "safety field innovation ecosystem" and a "characteristic entrepreneurship education system"**.

Build a safety science and technology innovation center and renovate and upgrade intelligent laboratories

Develop safety-related courses and textbooks to improve teachers' digital literacy

Develop entrepreneurship course resources and promote entrepreneurship training and incubation applications



Chongqing University of Science and Technology's Safety-Related Talent Training and Technological Innovation Center



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Where are the gaps? Workers and jobs



-  Tertiary education
-  Prime-age
-  Formal jobs
-  Large firms



-  Lower educated
-  Older age
-  Informal jobs
-  Micro firms

and large regional differences

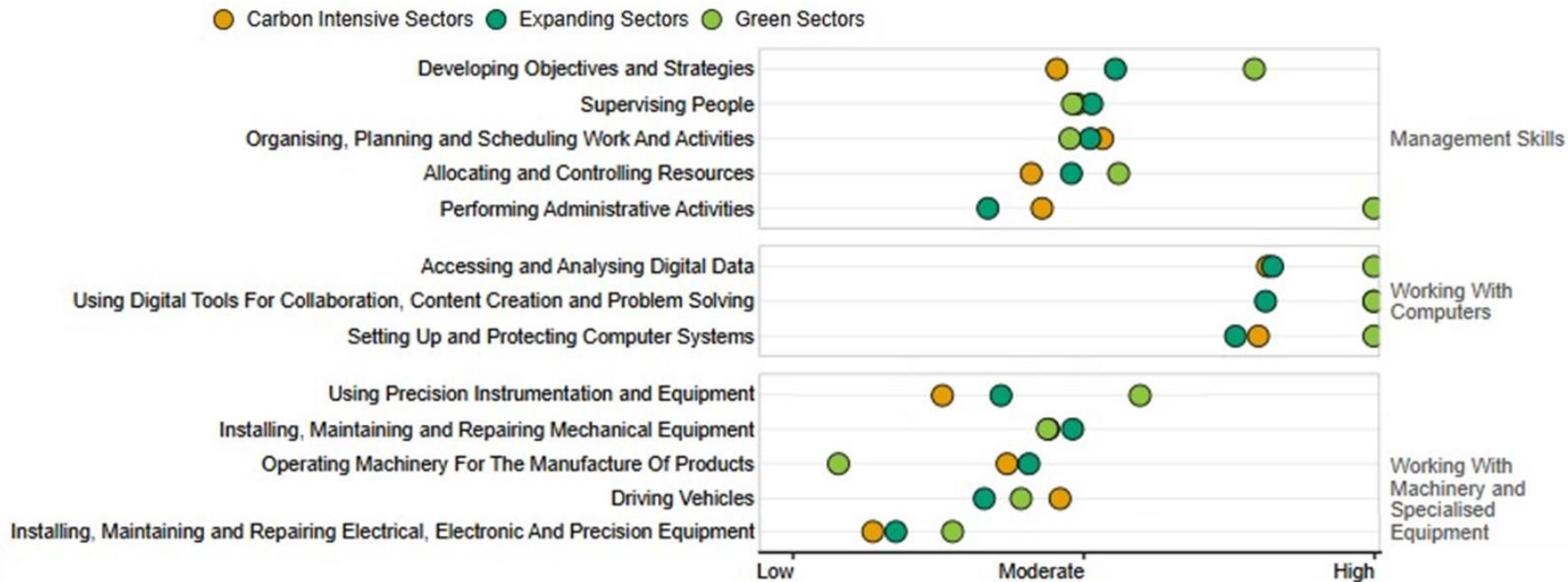


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Where are the gaps? Skills



Green jobs require more complex and technology-oriented skills

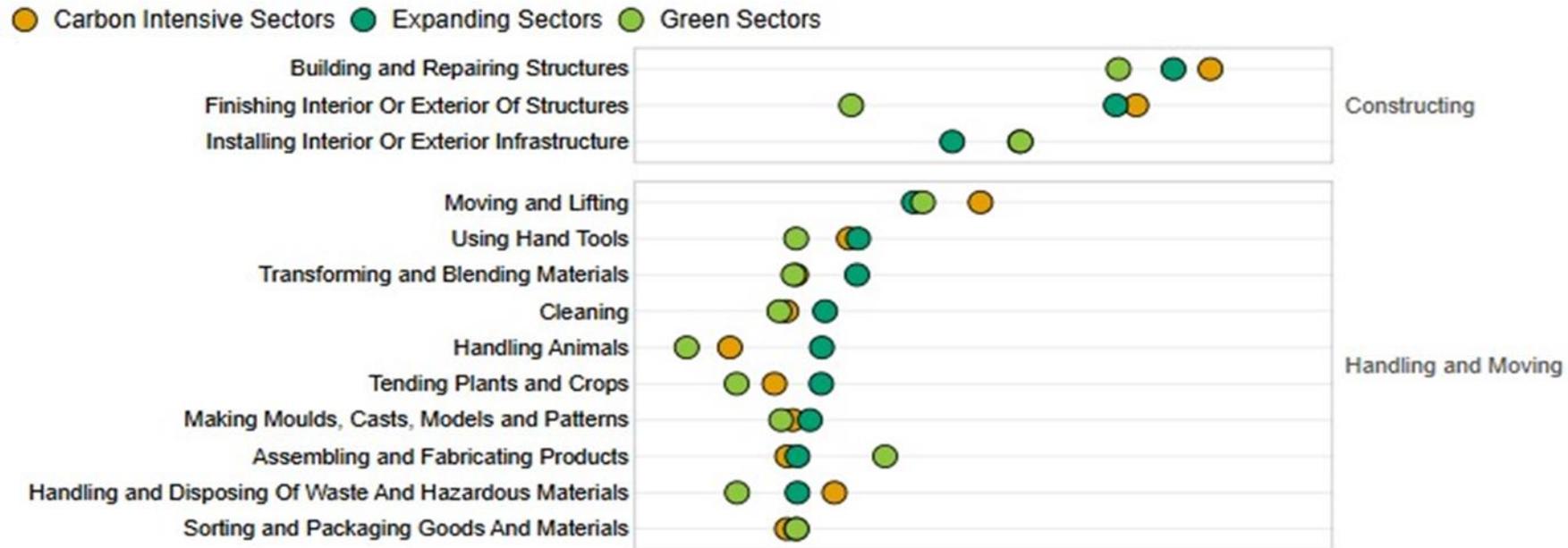


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Where are the gaps? Skills



Carbon-intensive jobs are construction and physically intensive

The establishment of a regional Green Skills Academy in the right way is essential for a successful implementation of the ASEAN Power Grid



ASEAN Energy Management Scheme (AEMAS) 2011

- 2 components:
 - Energy Management Gold Standard
 - Certified Energy Manager
- Decentralised implementation - each ASEAN Member State implements programme on its own
- Malaysia and Philippines still actively implementing the programme till today

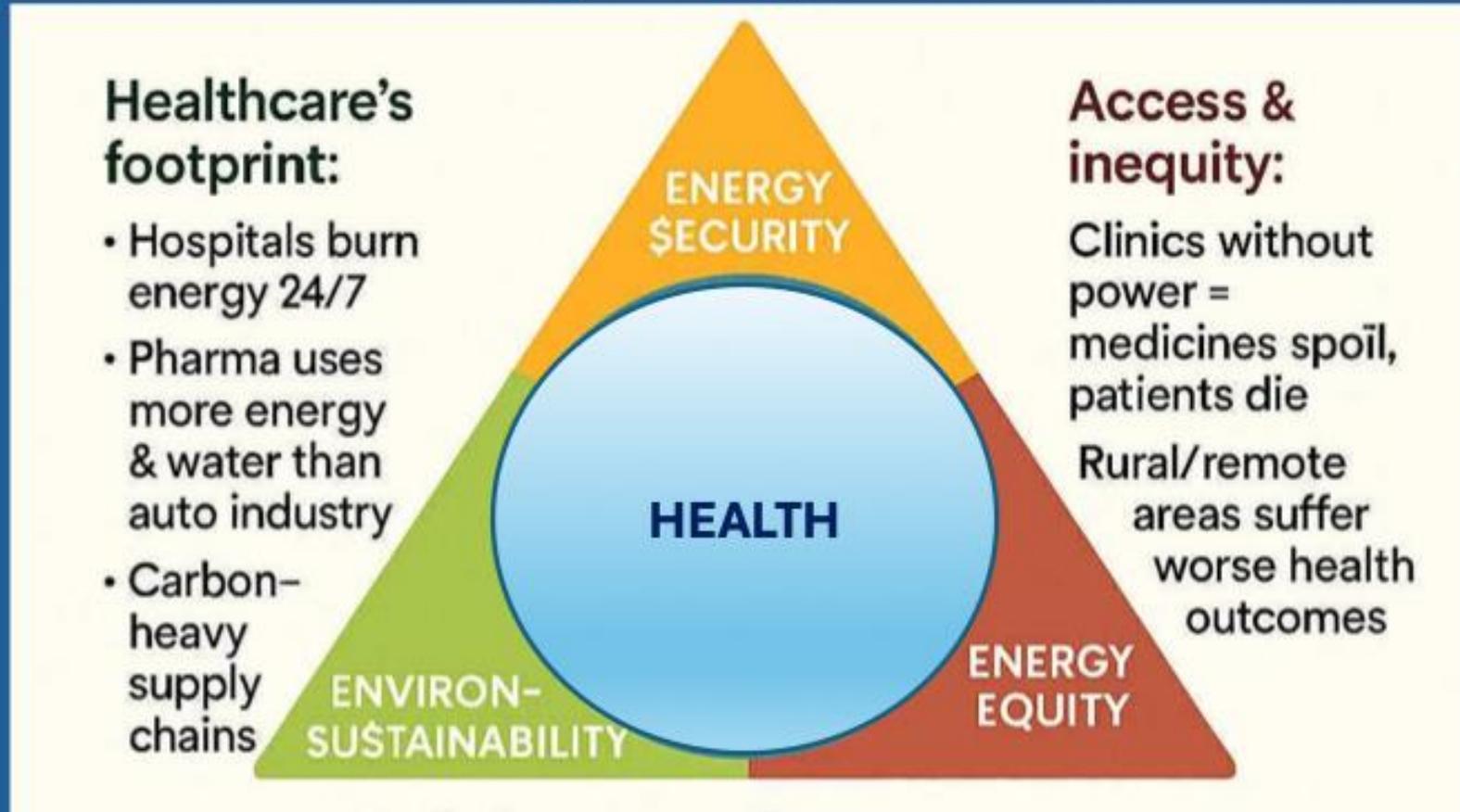
MGTC is the National Focal Point for AEMAS in Malaysia

Important elements for a successful and a sustainable regional model:

1. Common regional vision and ambition
2. Hub-and-Spoke governance model
3. Talent Mobility – Green Skills Passport
4. Industry benchmarked curriculum
5. Digital-First delivery model
6. Micro-Credentials – continuous learning
7. Just-Transition financing mechanism

THE PARADOX

The Health Sector is Saving Lives Today While Harming Health Tomorrow



THE CHALLENGE: HOW DO WE SOLVE THE EXTENDED TRILEMMA?
Energy . Health . Sustainability



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Hardware Support for Innovation Ecosystem: "Green Infrastructure + Intelligent Laboratories"

- **Focus on building a safety science and technology innovation center.** The project adopts designs such as optimized use of natural light, rainwater recycling systems, and low-carbon building materials, reducing building energy consumption by 20% compared with traditional standards. Currently, 50% of the civil works has been completed.
- **Promote the intelligent upgrading of engineering laboratories.** Along with ADB fund, CQUST has raised funds independently to build 21 laboratories including the "New Energy Safety Laboratory", which have been completed and put into use, enabling the integrated virtual and real upgrading of practical teaching for 55 science and engineering majors across the university.
- **Create a smart teaching environment.** Build a new academic affairs management system and a smart teaching platform to support the innovation of classroom teaching.



Innovation Experiment Building of the Safety Science and Technology Innovation Center



Partial BIM Design Models



Prefabricated Building Materials and Water Environment Laboratory



Intelligent Material Processing and Additive Manufacturing Laboratory



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Software Improvement for Innovation Ecosystem: "Teaching Resources + Integration of Professional and Entrepreneurial Education"

Enriching Artificial Intelligence Teaching Resources

- established 45 "Artificial Intelligence + Courses" in safety
- developed 43 digital textbooks supporting high-level courses
- developed public safety courses in collaboration with China University of Petroleum (East China) and other institutions

Consolidating the Foundation of Virtual Simulation Experiments

- Establish virtual simulation experimental training facilities.
- Build a diversified virtual simulation resource system.
- Purchase scientific research and technical software for safety-related majors.

Enhancing Teachers' Professional Skills and Digital Literacy

- Support 50 teachers to participate in international conferences and academic activities
- Organize 30 teachers to attend teaching seminars
- Invite 40 experts to conduct teaching competence training

Building a Talent Training Model Integrating Professional and Entrepreneurial Education

- Invite 50 experts to demonstrate professional talent training programs
- Host the 3rd Chongqing University Students' Safety and Emergency Skills Competition
- Invite 50 industry experts to guide students' innovation projects



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Teachers' teaching capacity improvement services



Students' innovation and entrepreneurship education services



Safety evaluation and safety consulting services



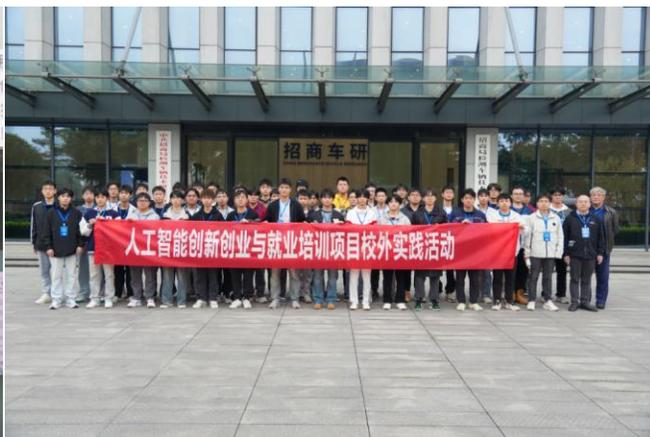


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Dual Drive of Entrepreneurship Education: "Entrepreneurship Courses + Practical Training"



- Develop the course "Practical Innovation and Entrepreneurship". Simulate the future career survival scenarios of college students and create 50 micro-courses.
- Establish a Women's Innovation and Entrepreneurship Club. Conduct activities such as scientific research achievement exchanges and entrepreneurship salons, training a total of 434 participants.
- Carry out artificial intelligence innovation, entrepreneurship and employment training. Covering more than 1,000 person-times, 117 teachers and students have obtained AI skill certifications.
- Carry out a series of practices and training on "AI Commercial Value Visualization", including 11 special AI practical training sessions with a total of 570 person-times.

Women account for 43.5% of the training participants, fully reflecting the commitment to inclusive development.



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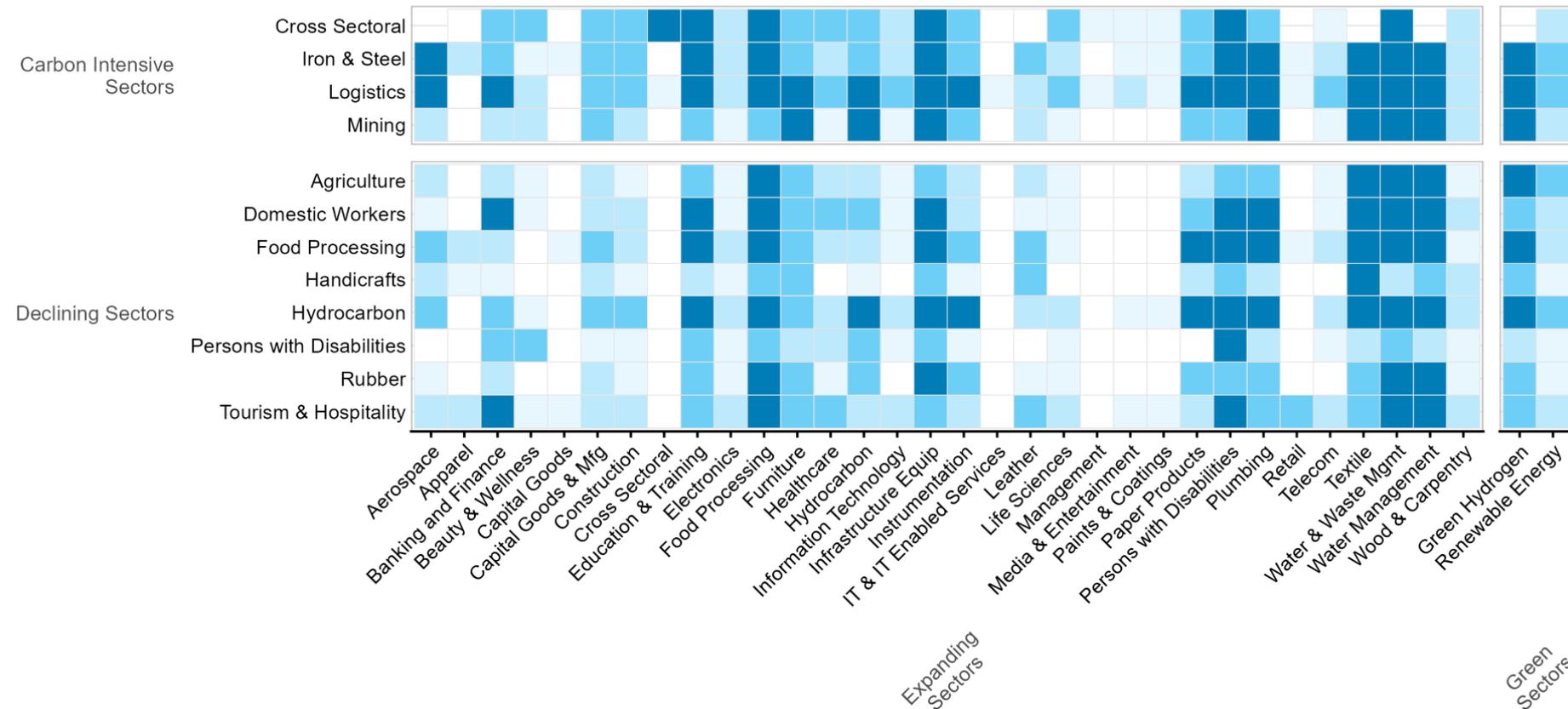
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Reskilling based on occupational similarity

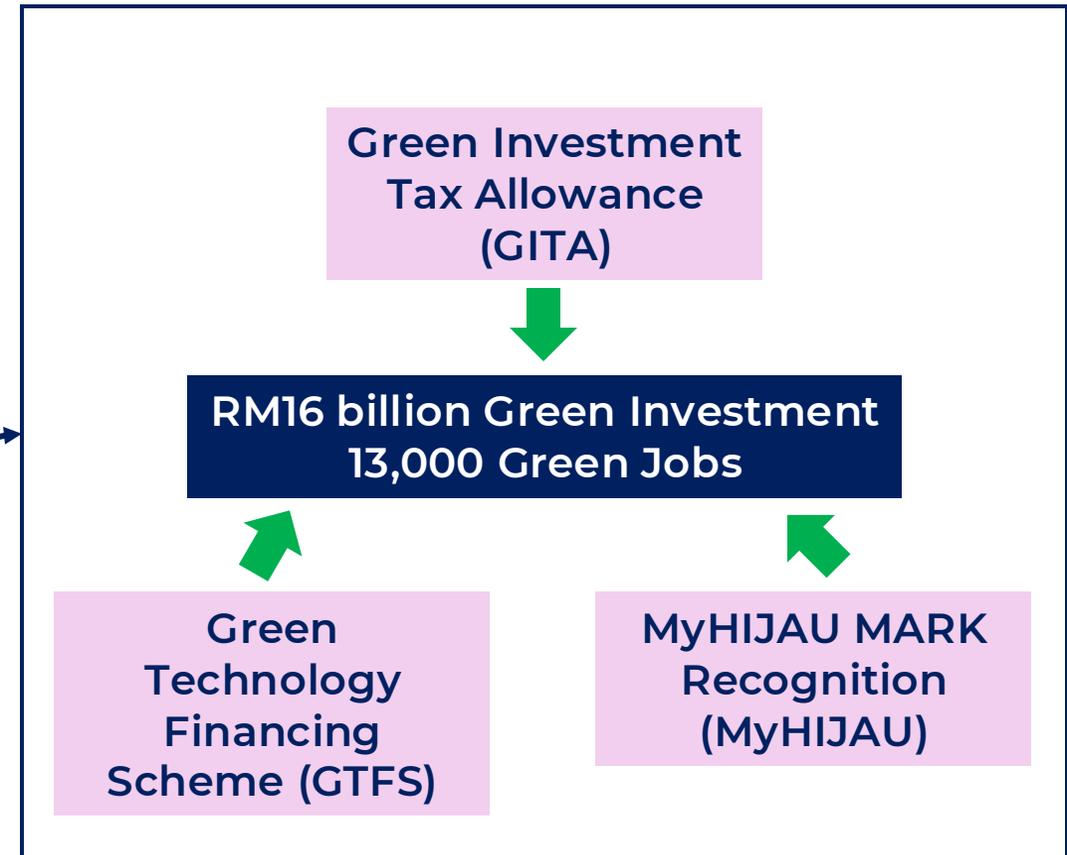
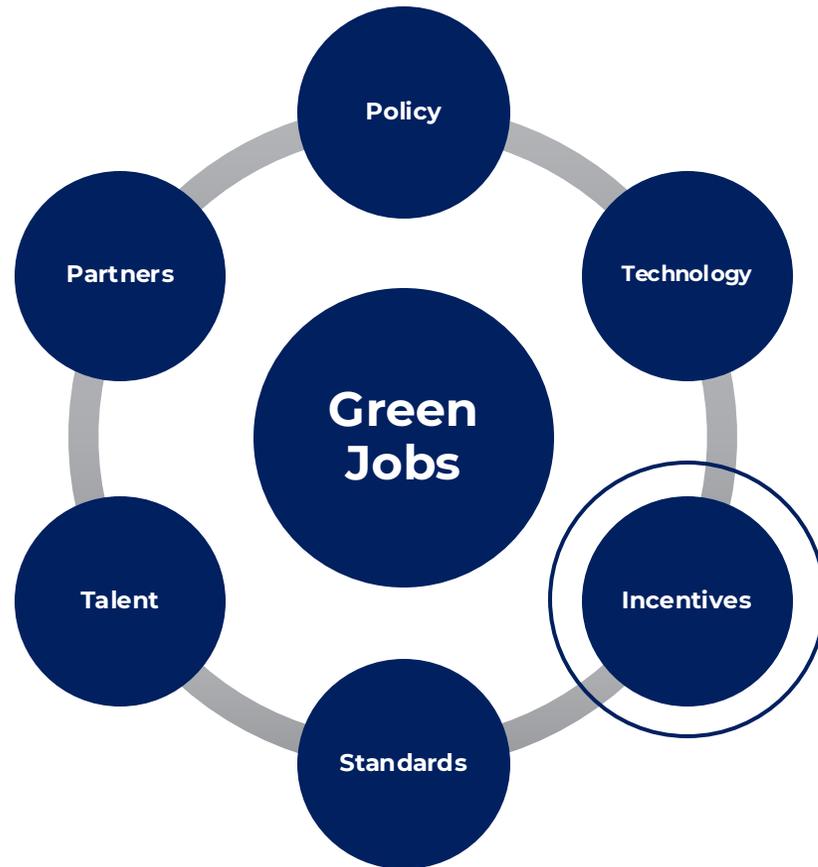
Very Low Low Moderate High Very High



Significant overlap with occupations in **green hydrogen, manufacturing, and water and waste management**

More limited overlap with renewable-energy jobs

Supporting business transition towards green and sustainability through incentives are what creates sustained green jobs



Cumulative impact across 3 programmes since 2010

Lateral Learning Program Course Structure: Learning Modules

Day	Theme	Focus Areas
Day 1	 Policy Innovation & Institutional Aspects	National/regional policy, planning, regulatory standards, inclusive governance
Day 2	 Techno-Economic & Social Challenges	Smart grids, distributed energy, affordability, emerging technology & digital tools
Day 3	 Social Implications & Workforce Development	Education, reskilling, local governance, social protection
Day 4	 Designing Inclusive Solutions & Peer Learning	Community engagement, GESI metrics, stakeholder co-design, contextual adaptation
Day 5	 Field Visit & Capstone	Site visit, stakeholder Q&A, group reflection, final presentations



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1

"Discipline-Industry-Region" Linked Characteristic Innovation Ecosystem in the Safety Field

By building a safety science and technology innovation center and intelligent laboratories, create a physical space integrating R&D, training, pilot testing, incubation and other related functions. Jointly build the "Safety Technology Collaborative Innovation Center" with Changshou and Dianjiang Economic and Technological Development Zones (other two subproject IAs) to promote the transformation of university scientific research achievements into enterprises in the industrial parks.

2

"Curriculum-Platform-Culture" Trinity Entrepreneurship Education System

Develop curriculum resources such as "Practical Innovation and Entrepreneurship" that integrate Silicon Valley entrepreneurship methods, forming a "technology + business" dual-track curriculum module. Build a Women's Innovation and Entrepreneurship Club, a virtual simulation entrepreneurship training platform, etc., to provide full-process support from creativity to entrepreneurship. Organize activities such as safety and emergency skills competitions and AI innovation and entrepreneurship training camps to create a campus atmosphere of "daring to venture and being able to innovate".

3

"Green + Inclusive" Dual-Oriented Sustainable Development Path

The building construction adopts green building standards and extends the concept of low-carbon operation to laboratory management through energy-saving transformation of equipment and recycling of waste. Develop "green safety" courses to cultivate students' awareness of the coordinated development of environmental protection and safety. Fully absorb women's opinions, fully consider women's needs in space design, curriculum development, and activity organization, and establish a Women's Innovation and Entrepreneurship Club.



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- **Anchor on characteristic disciplines to build an innovation ecosystem integrating industry and education.** Implementing departments should base on their own disciplinary advantages, identify the intersections between school and regional industries, Create a virtuous cycle in which universities empower industries and industries, in turn, support universities through co-building platforms, forming teams, and undertaking projects together.
- **Build an entrepreneurship education system of "combination of software and hardware, linkage of virtual and real".** Build a functionally entrepreneurship practice spaces hardware), develop curriculum resources integrating professional majors and entrepreneurship (software), and create an atmosphere encouraging trial and error and advocate innovation culture.
- **Integrate green and inclusive concepts into the entire cycle of project construction and operation.** Conduct gender demand surveys in the early stage of the project, adopt green technical standards during construction and operation, and establish carbon management and inclusive participation mechanisms during operation to realize the organic combination of economic, environmental and social benefits.

ADB for its financial support and guidance

Chongqing Municipal Government and PMO guidance, and the project management consultants for technical support

Welcome to visit Chongqing and further exchange on the ADB loan project

Thank you.