

Lessons from China's CSP Policy and Industrial Strategy

Alina Gilmanova

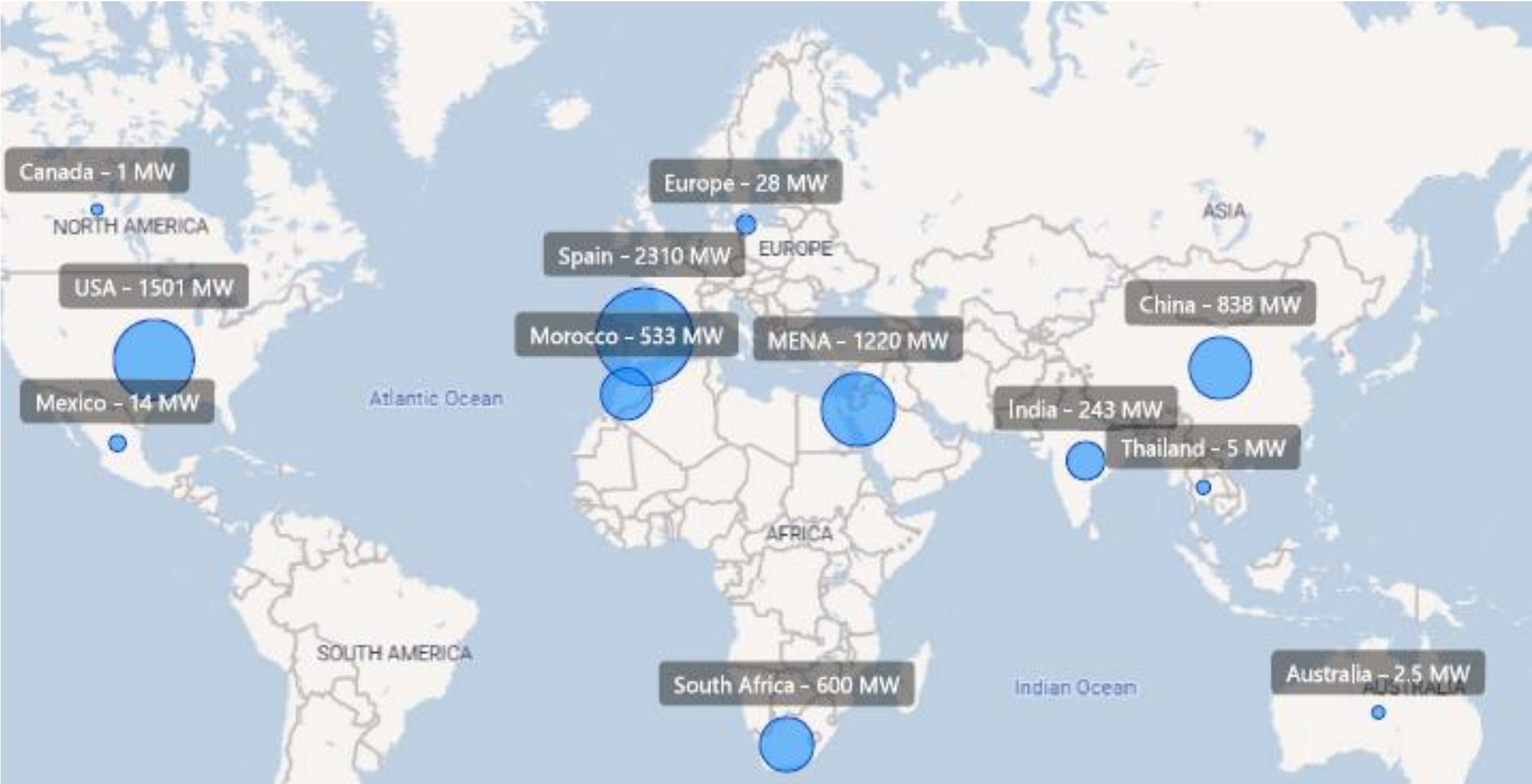
Consultant at the IRENA and Co-founder of



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Global CSP capacity is steadily expanding, led by key countries, and must accelerate significantly to meet international climate goals.

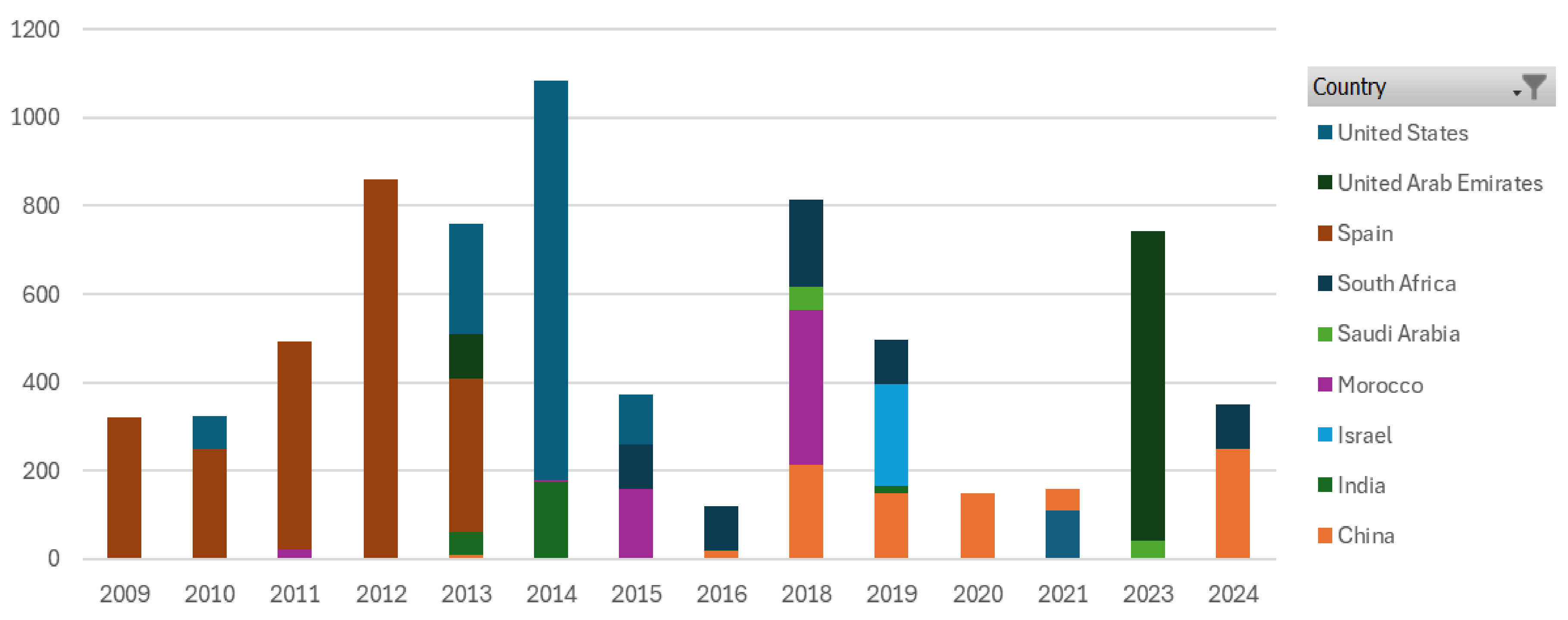
Global CSP: Growing Capacity, Urgent Scale-Up.



Map of global CSP deployment with total installed capacity

- Current operational CSP capacity is **7.4 GW globally**, with 3.3 GW under construction (mainly in China). Key regions include China, Spain, USA, MENA, and South Africa.
- The 1.5°C pathway requires global scaling to **196.7 GW** by 2030.

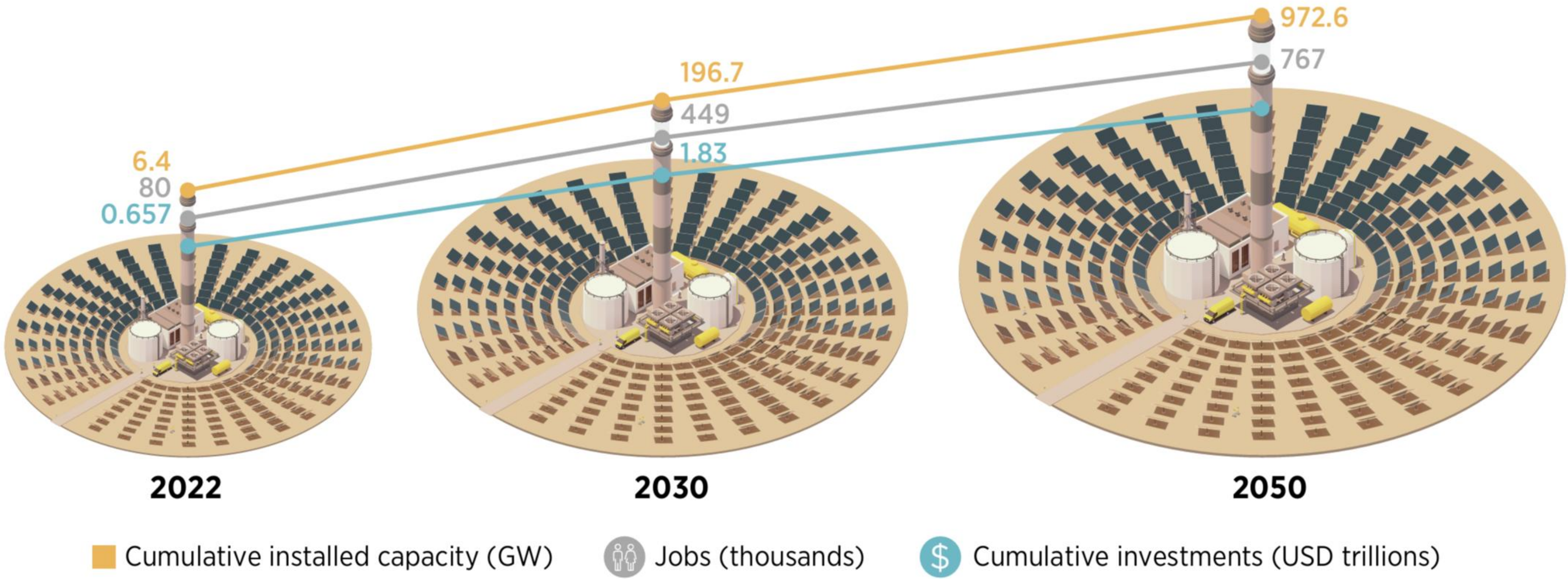
CSP market update - Operational CSP



Source: CSP Guru

Pathway to 1.5°C: Concentrated Solar Power

Estimated cumulative CSP capacity, investments and employment in 2023 and those needed in 2030 and 2050 to achieve the energy transition objectives of the Paris Agreement



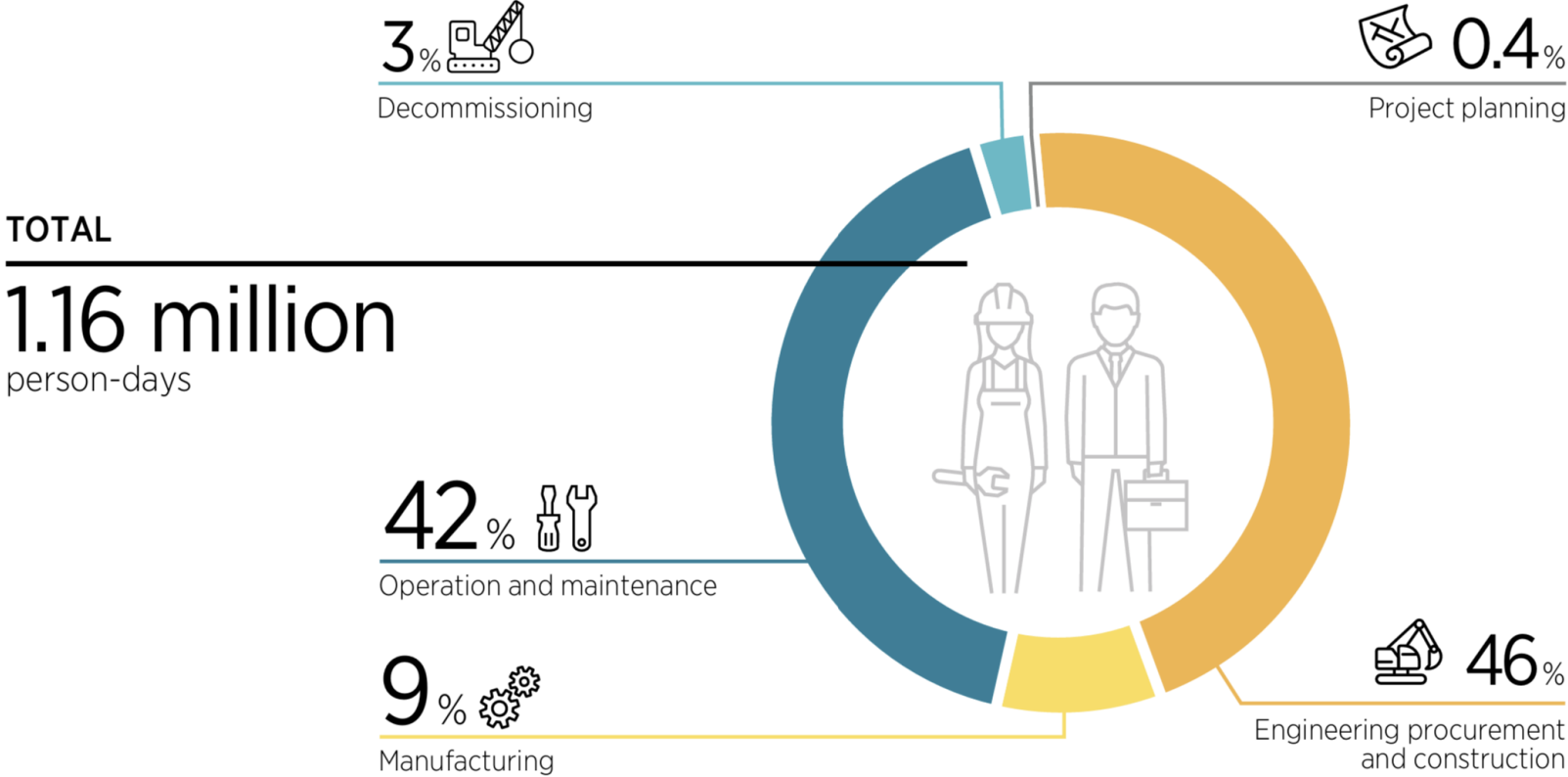
Based on: (IRENA, 2023) and (IRENA and ILO, 2023).
Notes: CSP = concentrated solar power; GW = gigawatt.

Source: IRENA (2025), Renewable energy benefits: Leveraging local capacity for concentrated solar power, International Renewable Energy Agency, Abu Dhabi.

CSP development globally stimulates local economic value through material sourcing and manufacturing, fostering diverse skilled employment.

Global CSP: Local Materials, Diverse Skills.

- CSP plants globally use common materials like concrete and steel, plus specialized items like nitrate salts and glass, offering local sourcing potential.
- Manufacturing provides further local opportunities. Labor demand spans medium/low-skilled roles (79%) to STEM-focused jobs (13%).



Key Takeaways

- High demand for local materials globally.
- Manufacturing boosts diverse local industries.
- Broad skills spectrum needed worldwide.

Distribution of labour across the value chain for the development of a 100 MW CSP plant with ten-hour TES capacity

Source: IRENA (2025), Renewable energy benefits: Leveraging local capacity for concentrated solar power, International Renewable Energy Agency, Abu Dhabi.

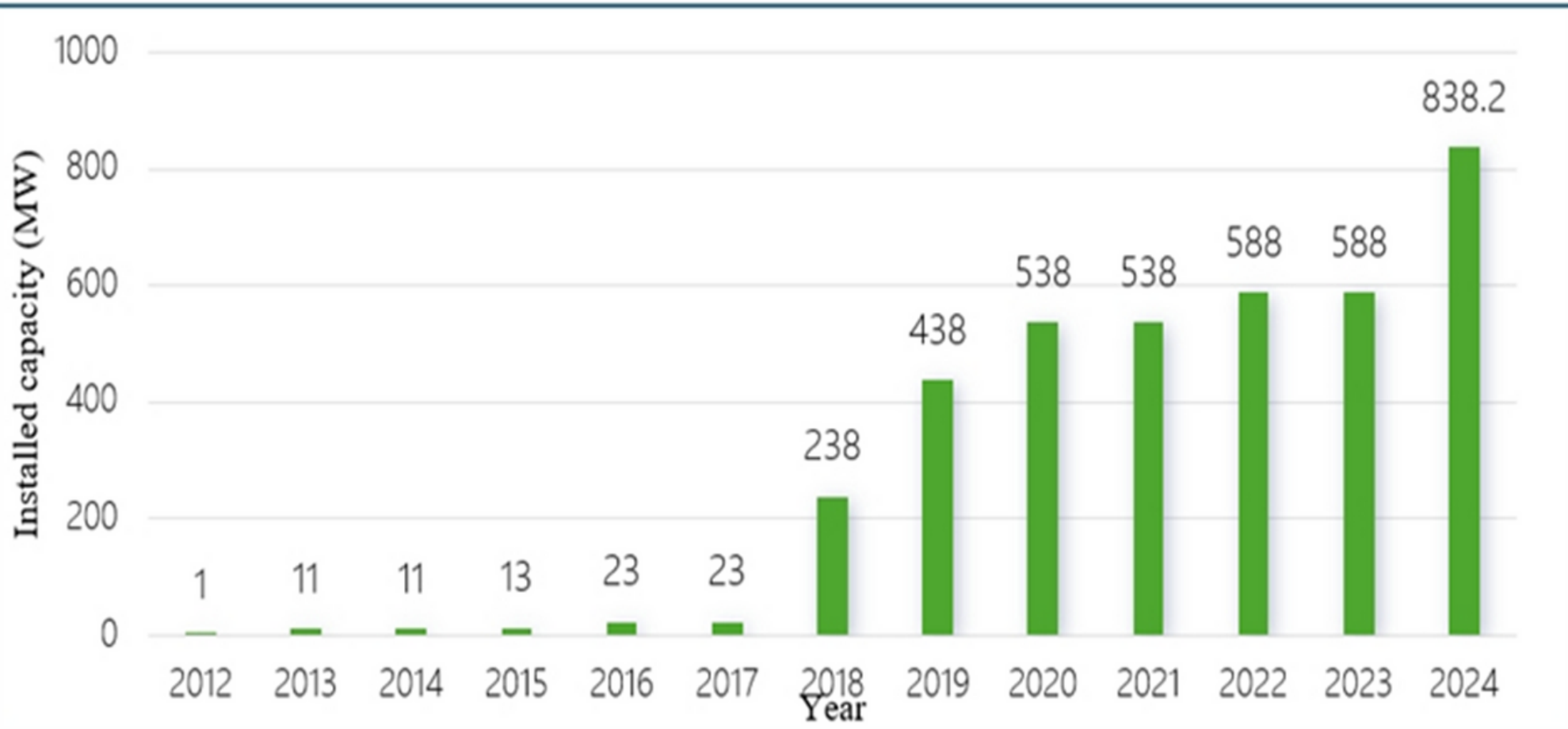
Chinese CSP development



Global CSP costs have fallen dramatically, making it an increasingly competitive renewable energy choice worldwide.

Chinese CSP: Increasing the number of projects annually.

Annual added new installed capacity of CSP in China



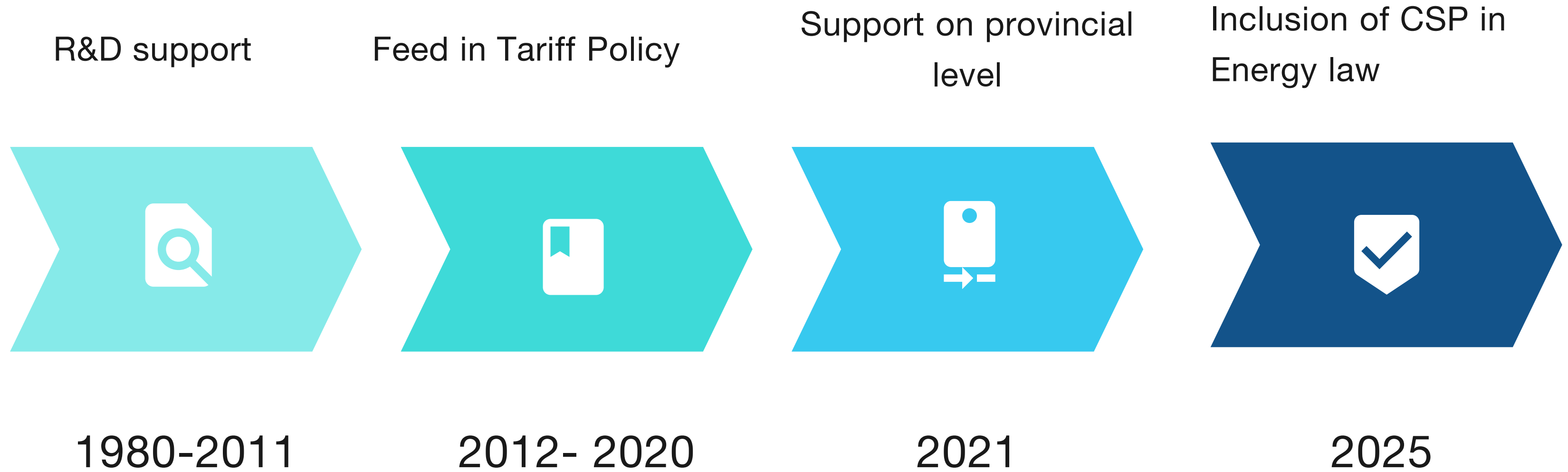
- Current Installed capacity is 838.2 MW,
- representing 10.6% of the world's installed solar capacity.
- 34 CSP projects are currently under construction in China, with a total installed capacity of 3,300 MW,
- 37 CSP projects are planned, with a total installed capacity of approximately 4,800 MW.

Key Takeaways

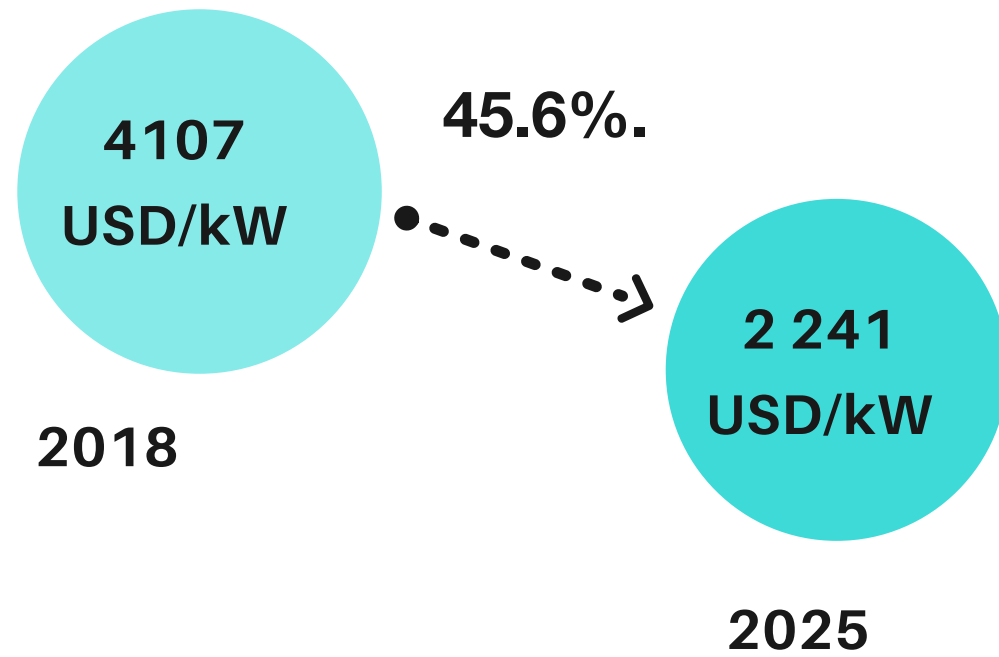
- Every year China announces new projects
- By 2030 China will have more than 4 GW of installed capacity of CSP

Source: China Solar Thermal Industry Alliance, bluebook, 2025

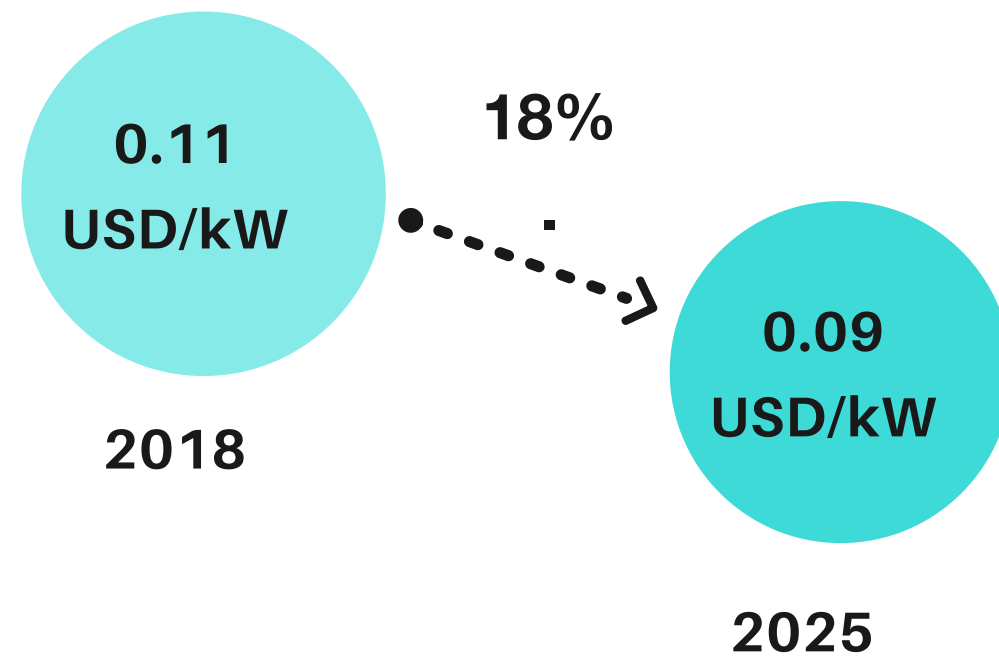
CSP POLICY IN CHINA



COST DECLINE IN CHINA



CAPEX of a 100MW Tower-type CSP

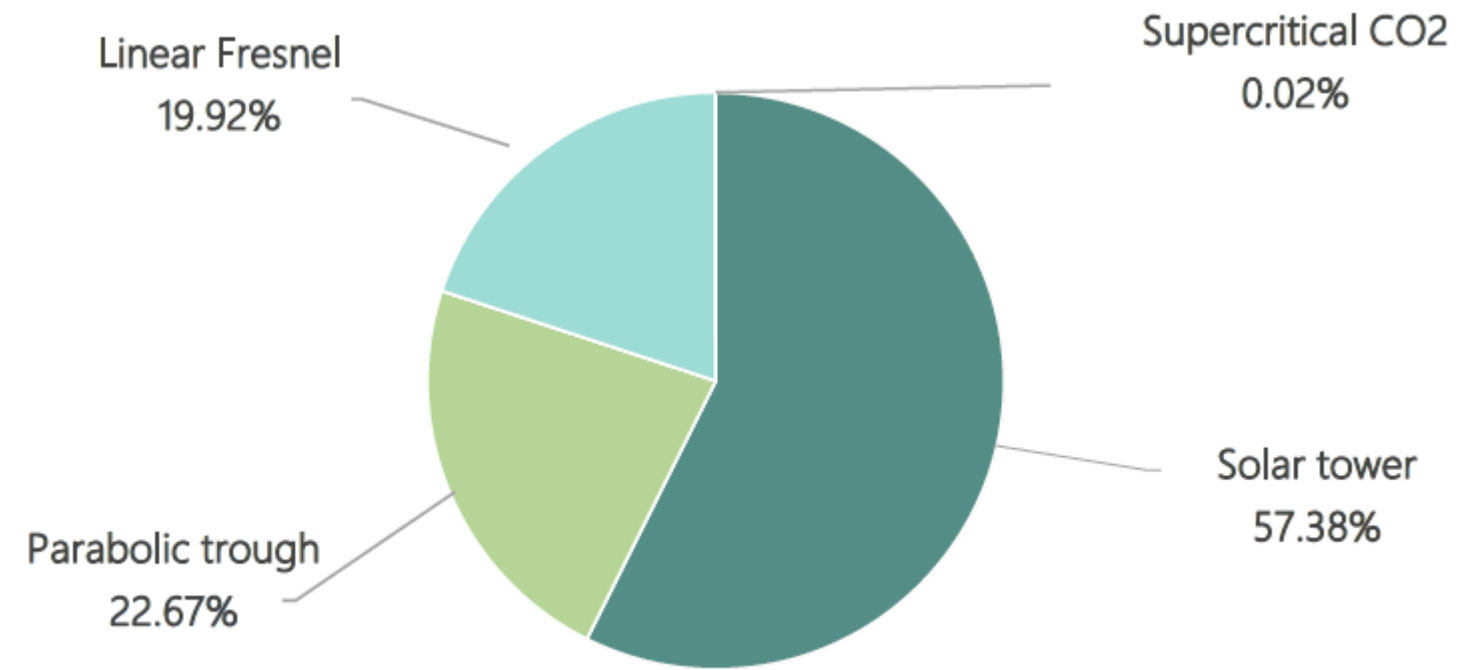


LCOE of a 100MW Tower-type CSP

Solar Tower technology dominated Chinese CSP sector

While PT is more common to be used outside of China, solar tower is preferred due to its higher efficiency.

The share of technology used in CSP power plants in China



- Solar Tower technology is dominated due to higher temperature possibilities
- Supercritical CO2 technology is already operation with 1 MW demonstration power plant

	1 st generation	2 nd generation	3 rd generation	4 th generation
Efficiency	12%	20%	30%	35%
Receiver temperature	230-430°C	375-530°C	650-950°C	800-1100°C
Medium	Water/thermal oil	Nitrate/liquid metal	Air/foam ceramics	Carbonate/chlorides / ceramic granules
2006-2010	1MW Demonstration	0.1MW Experimental	1MWt Experimental	0.02MWt Conceptual design
2011-2015	10MW Demonstration	10MW Demonstration	5MWt Demonstration	1MWt Experimental
2016-2020	100-1000MW Commercial	100MW Commercial	1MW Demonstration	10MWt Demonstration
2021-2025		1000MW Commercial	5MW Demonstration	1MW Demonstration
2026-2030			100MW Commercial	10MW Commercial

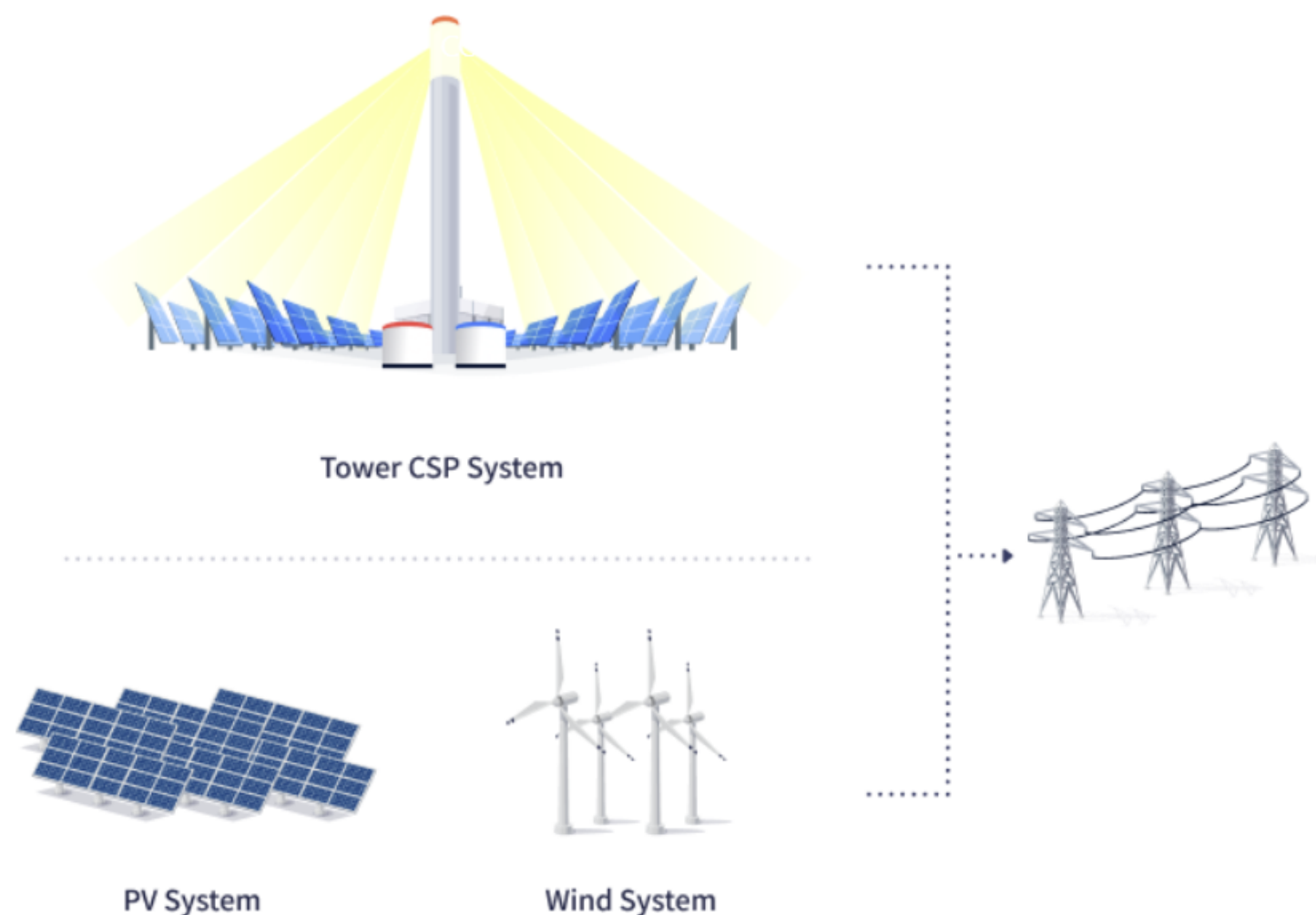
Source: China Solar Thermal Industry Alliance, bluebook, 2025

Fig. 1.1-6 CSP Technology Development Roadmap

Hybridization concept with PV and Wind

Combination of CSP with TES, Wind and PV further reduces the costs

Hybridisation concept



- CSP provides peak power supply and optimises the transmission line capacity
- When PV or wind power is at its peak production, CSP power stops generating electricity or runs at a low load and only charge TES providing only peak power in morning or evening.
- Electric heater can be installed to store the curtailed PV or wind
- The CAPEX reduces as the solar field could be also reduced

Key Takeaways

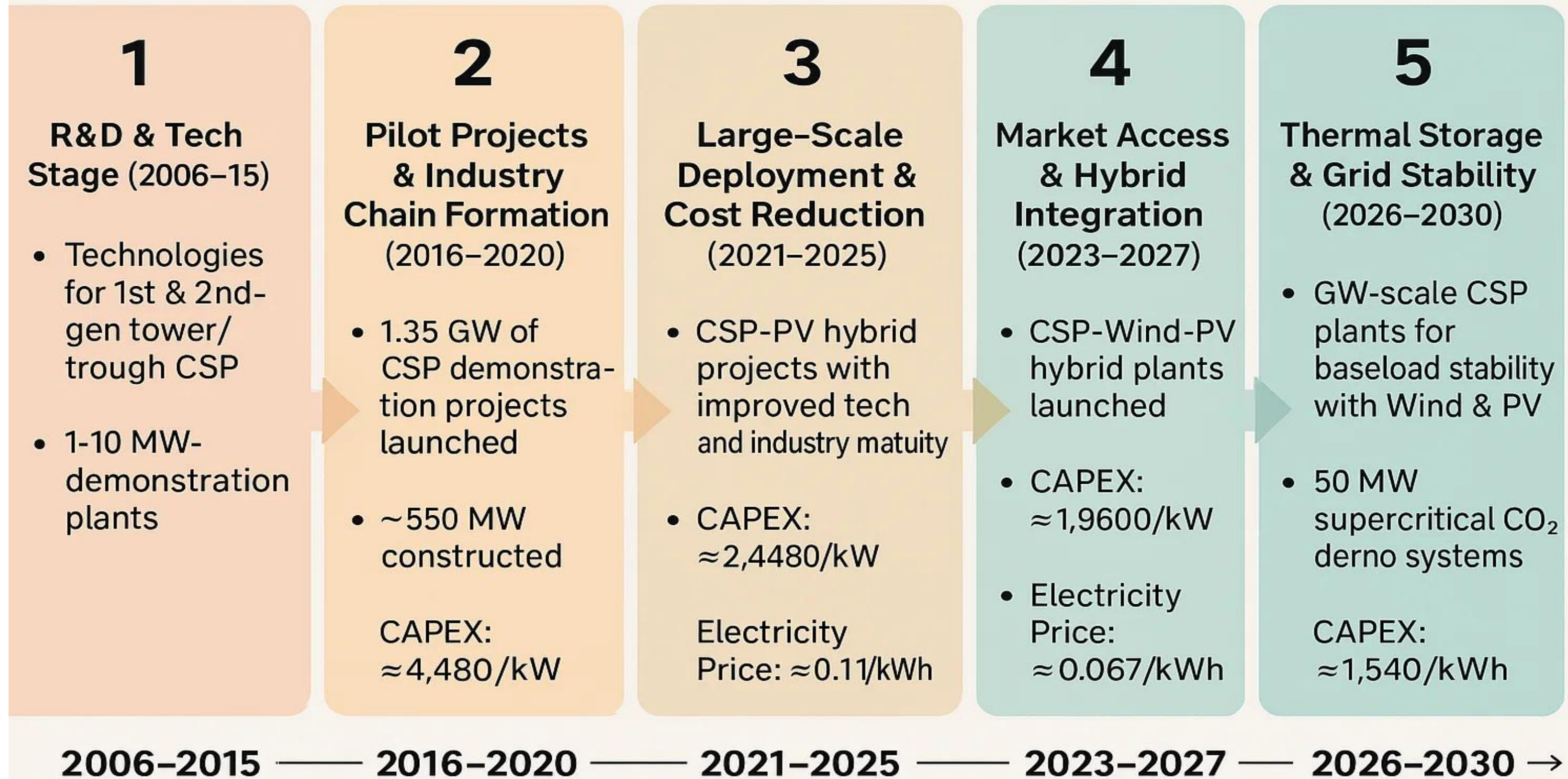
- Hybridization reduces the LCOE
- CSP provides peak power supply

Chinese Industry overview

- Total 440,000 enterprises engaged in the CSP industry chain,
- 14,000 state-owned enterprises,
- 421,000 private enterprises,
- 3,000 foreign-invested enterprises,
- 23,500 small and micro enterprises,
- 16,800 enterprises with patent information related to solar thermal power generation.



CSP industry stages in China



Remaining challenges for CSP industry

- Standardisation for design, construction, and equipment manufacturing is needed
- Economies of scale have not been fully achieved- plans for 1000 MW
- LCOE still remains at high levels and competitiveness with batteries
- CSP plants, due to their small proportion in hybridisation (1:6 or 1:9 CSP to wind/PV ratio) and role in peak shaving, are currently insufficient to significantly support the power grid
- CSP values have not been reflected in electricity prices
- Testing and measuring equipment in China are mainly imported equipment



Realizing CSP's full global potential requires concerted international efforts focused on stable policies, targeted finance, and local capacity building.

Unlocking Global CSP: Policy, Finance, Capacity.



Policy & Finance



National market & solar resources



Local industry



R&D investments



Skilled workforce and Diversity



Key global enablers include:

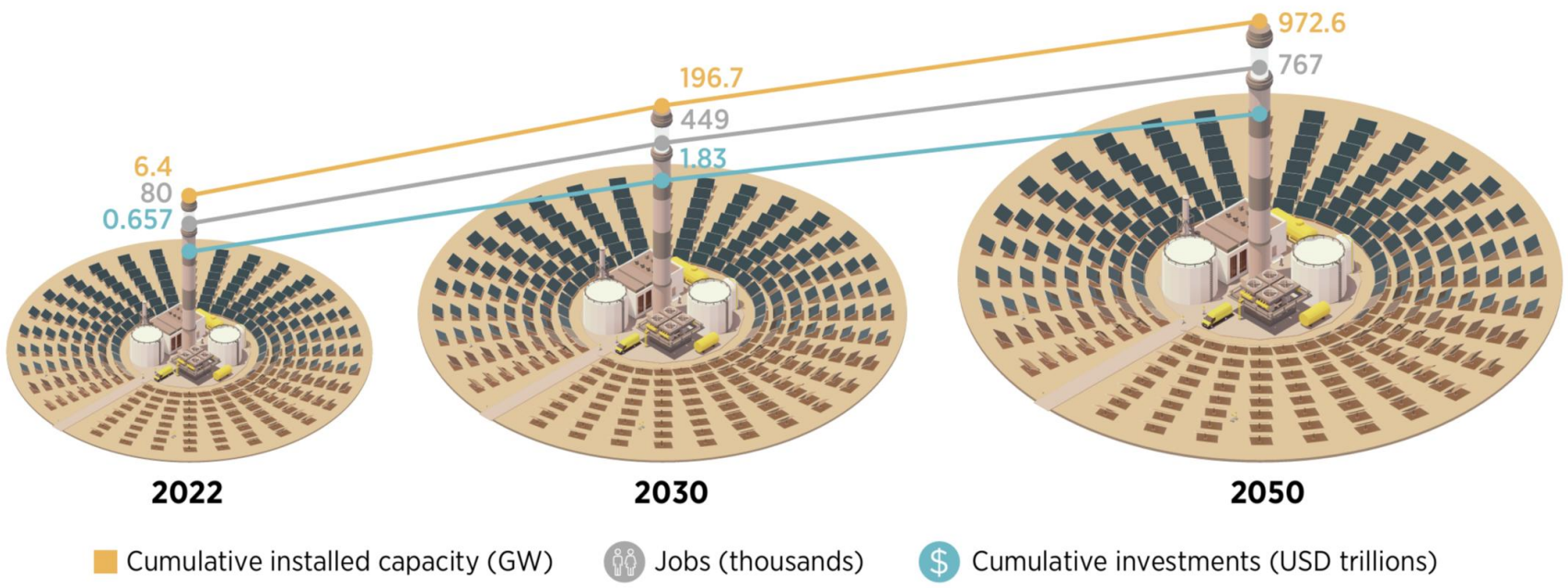
- stable, long-term energy targets, especially for dispatchable renewables, which value storage;
- affordable finance and investment incentives across nations;
- strengthening local supply chains and skills worldwide, especially in EPC and O&M
- continued R&D investment with international collaboration.

Accelerating global CSP deployment is imperative for a timely energy transition, requiring decisive international policy action and strategic investment.

Global CSP: Act Now for Energy Future.

- CSP offers proven cost-effective, dispatchable renewable energy and significant socio-economic value globally.
- To achieve the necessary scale (e.g., ~197 GW by 2030 worldwide), nations must prioritize clear targets for dispatchable RE, streamline financing, and foster local value chains.

Estimated CSP capacity, investments and employment by 2050



Key Takeaways

- CSP is proven & valuable globally.
- Urgent worldwide scale-up needed.
- Global Action: Targets, finance, local value.



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Gender-balanced teams have been shown to perform better and foster creativity

Perspective | Published: 24 September 2018

Making gender diversity work for scientific discovery and innovation

[Mathias Wullum Nielsen](#) , [Carter Walter Bloch](#) & [Londa Schiebinger](#)

Nature Human Behaviour **2**, 726–734 (2018) | [Cite this article](#)

6626 Accesses | 160 Citations | 166 Altmetric | [Metrics](#)

Abstract

Gender diversity has the potential to drive scientific discovery and innovation. Research shows that gender diversity: diversity in research questions. While gender composition of research teams

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SEPTEMBER 2015



International Review of Economics & Finance

Volume 93, Part A, June 2024, Pages 1001-1020



Are women greener? Board gender diversity and corporate green technology innovation in China

[Shaner Chu](#) ^{a b}  

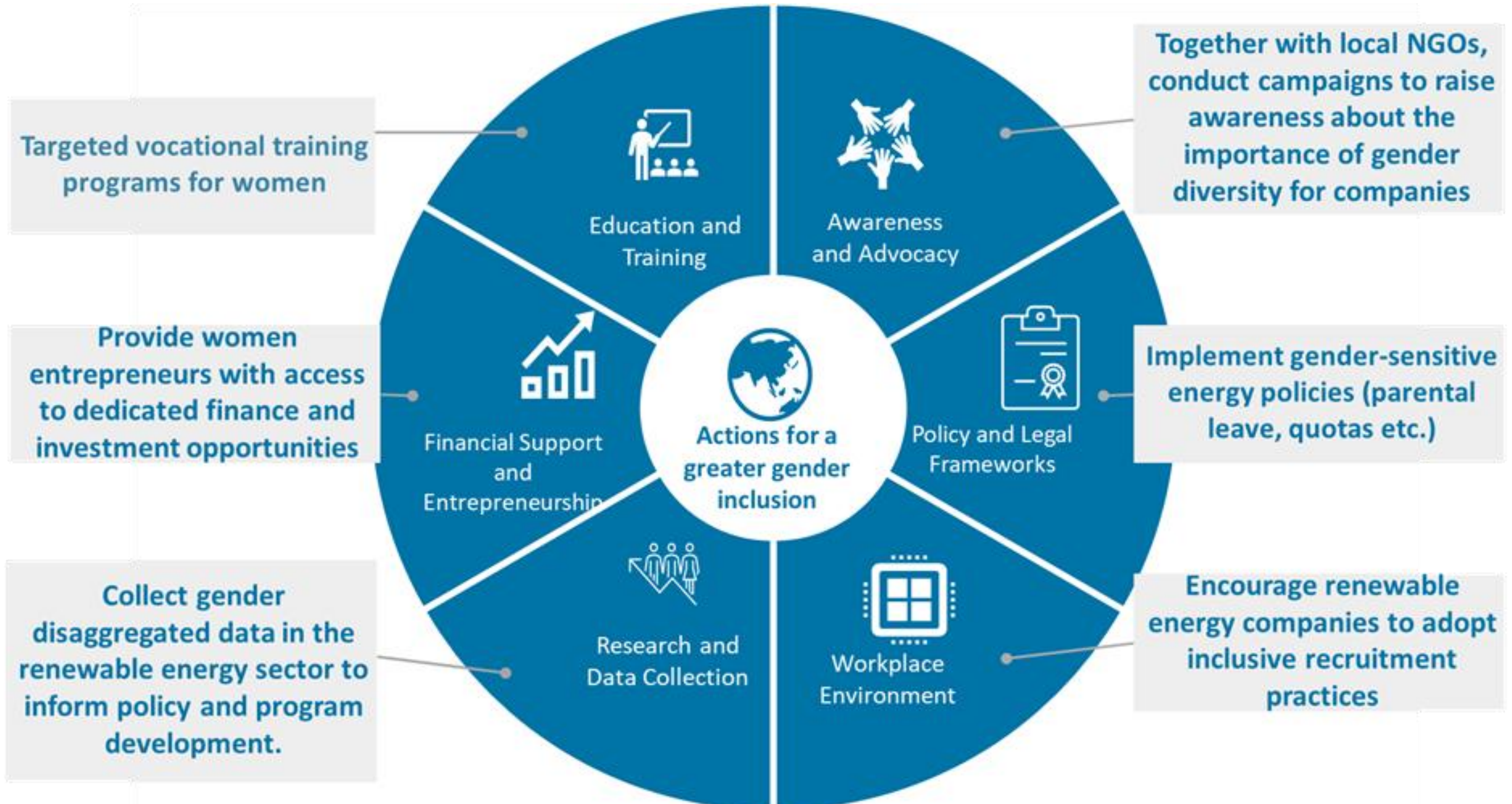
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Our story

We are a group of international researchers & professionals
**supporting & promoting underrepresented genders
in the concentrated solar sector**

Born in SolarPACES 2022, Albuquerque



women.solarpaces.org

Supported by SolarPACES





**WOMEN+ IN
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Our team



Alina Gilmanova, FR/CN



Marina Casanova, ES



Audrey Soum-Glaude, FR



Rebecca Mitchell, US



Sabrina Hasni, NL



Esther Rojas, ES



Meriem Chaanaoui, MA



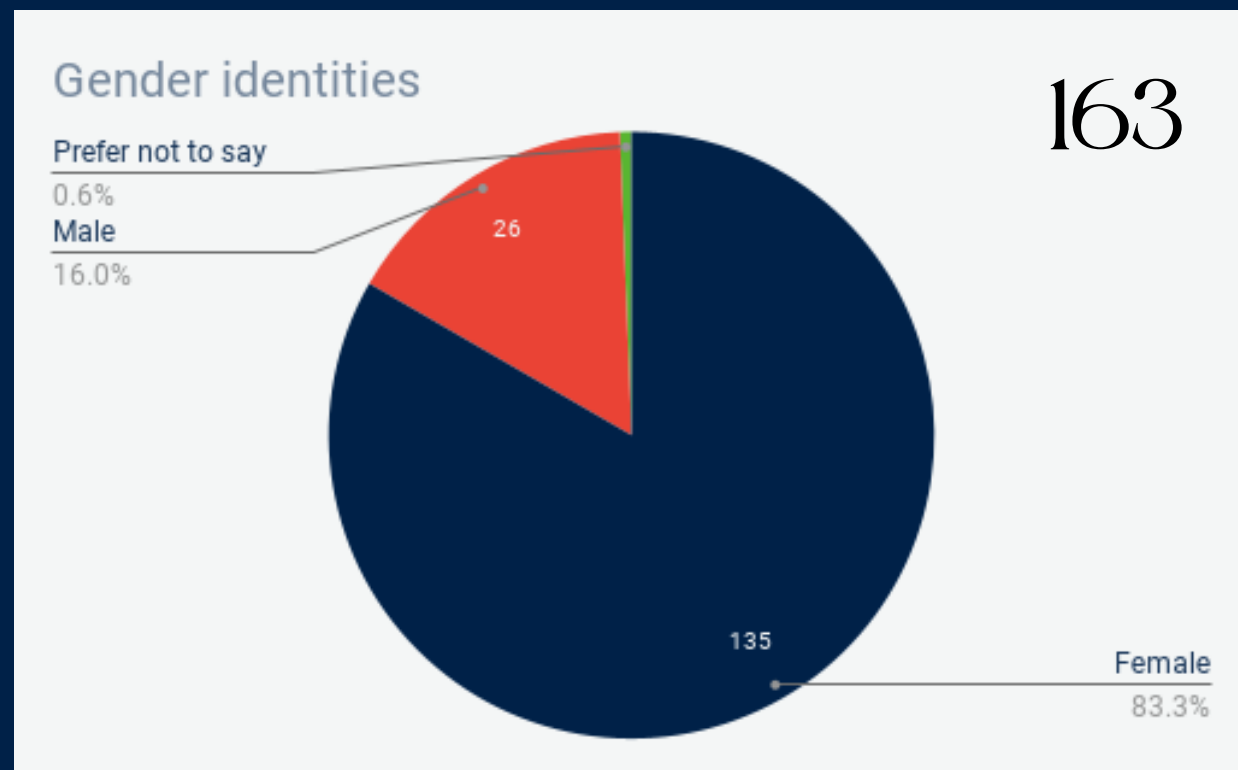
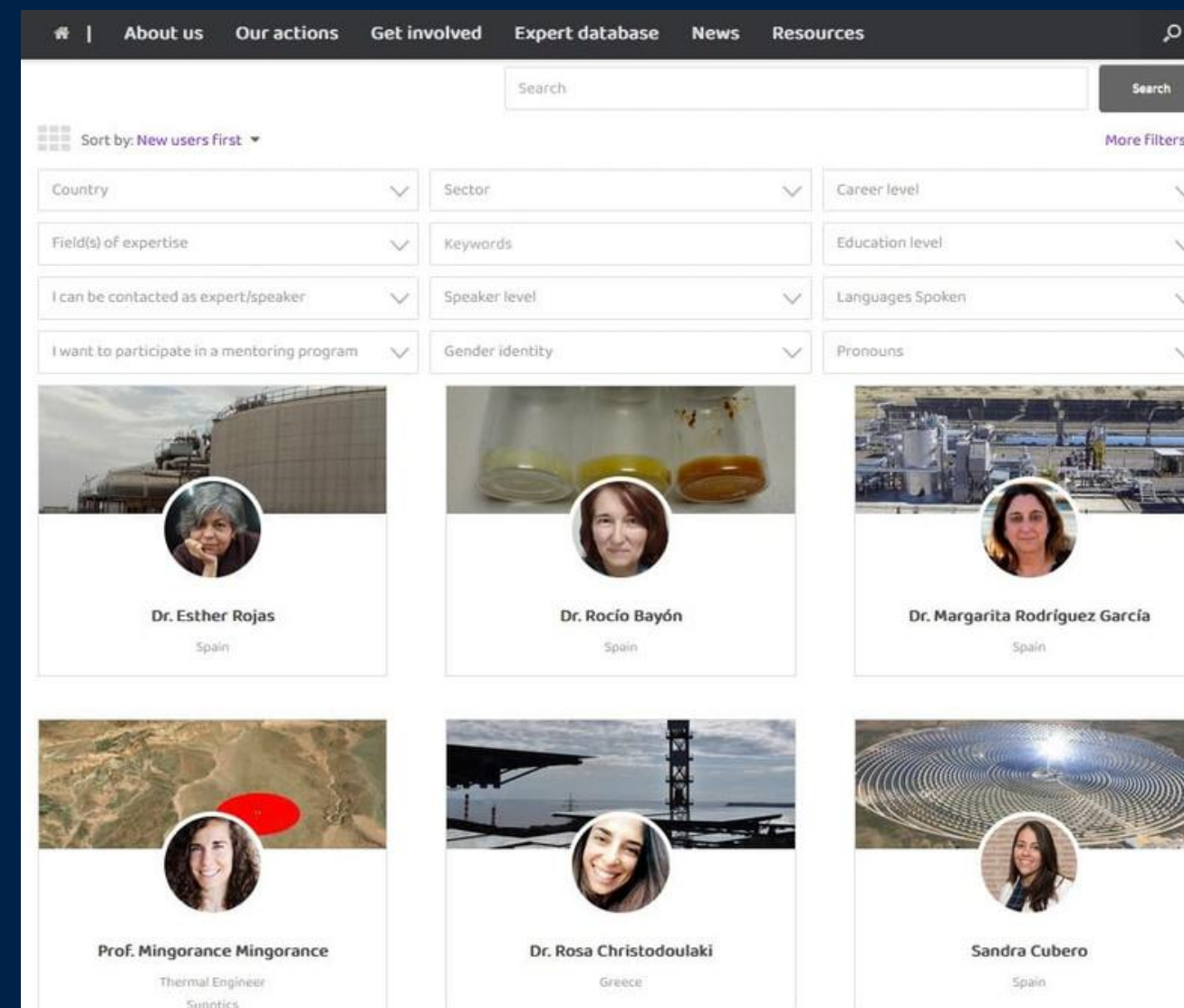
Mounia Karim, UK



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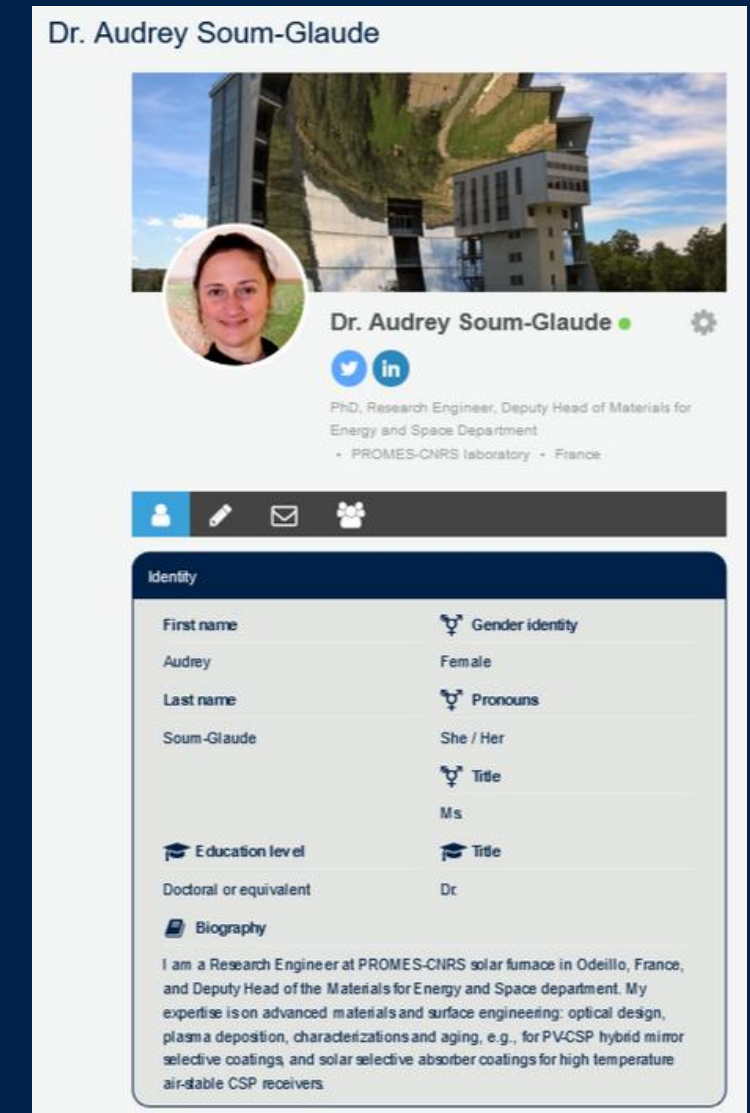
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- Gender identity
- Pronouns

Grid of Expert Profiles:

- Dr. Esther Rojas** (Spain)
- Dr. Rocío Bayón** (Spain)
- Dr. Margarita Rodríguez García** (Spain)
- Prof. Mingorance Mingorance** (Thermal Engineer, Sunnics)
- Dr. Rosa Christodoulaki** (Greece)
- Sandra Cubero** (Spain)



Dr. Audrey Soum-Glaude

PhD, Research Engineer, Deputy Head of Materials for Energy and Space Department
- PROMES-CNRS laboratory - France

Identity

First name	Audrey	Gender identity	Female
Last name	Soum-Glaude	Pronouns	She / Her
Education level	Doctoral or equivalent	Title	Ms
Biography	I am a Research Engineer at PROMES-CNRS solar furnace in Odeillo, France, and Deputy Head of the Materials for Energy and Space department. My expertise is on advanced materials and surface engineering: optical design, plasma deposition, characterizations and aging, e.g., for PV-CSP hybrid mirror selective coatings, and solar selective absorber coatings for high temperature air-stable CSP receivers.		

✨ Underrepresented genders include cis women, trans women, trans men, non-binary people, and people who may be questioning their gender.



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Our actions

- Networking events
- Webinars
- Mentorship programs

JANUARY'S MOST POPULAR WEBINAR 

Webinar: The untapped potential of small scale CSP



 Australian National University
Ye Wang
Research fellow




Natalie Lorenz Anderson
Vice President Operations




Sabrina Hasni
Representative of Women+ in Concentrated Solar leadership team

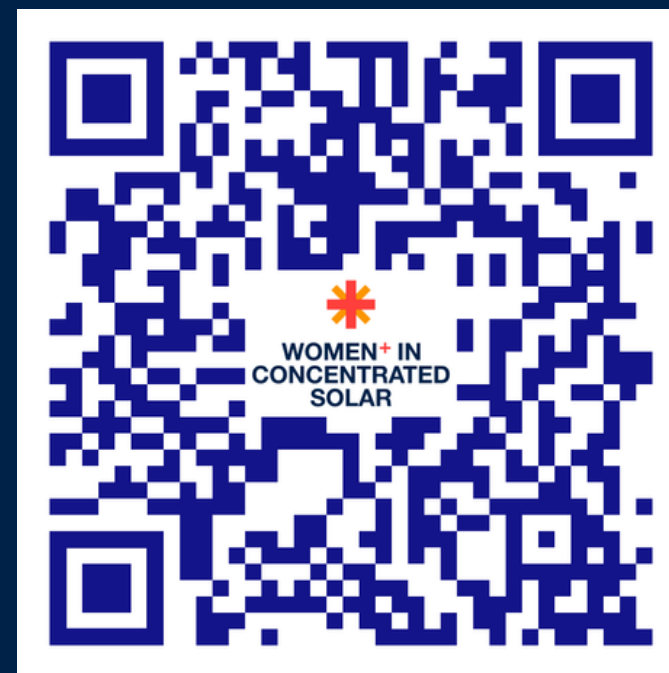



Belén Gallego
CEO [Moderator]

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