

Seminar on further implementation of the Joint Crediting Mechanism (JCM)  
in Republic of Chile

Ministry of Economy, Trade and Industry Japan  
JCM Feasibility study 2024

The AGC logo is displayed in a white rectangular box on the right side of the slide. It consists of the letters 'AGC' in a bold, blue, sans-serif font. A small red square is positioned to the right of the letter 'G'.

## **Feasibility study for introducing Concentrated Solar Power (CSP) to mining industry in Republic of Chile**

**AGC Inc.**

2024/12/19

Your Dreams, Our Challenge  
©AGC Inc.

1. Company introduction
2. Concentrated Solar Power (CSP) and related technology
3. Summary of our feasibility study
4. Schedule, Next step

# 1. Company overview Basic Information

Former Asahi Glass Co., Ltd.  
旧 旭硝子株式会社



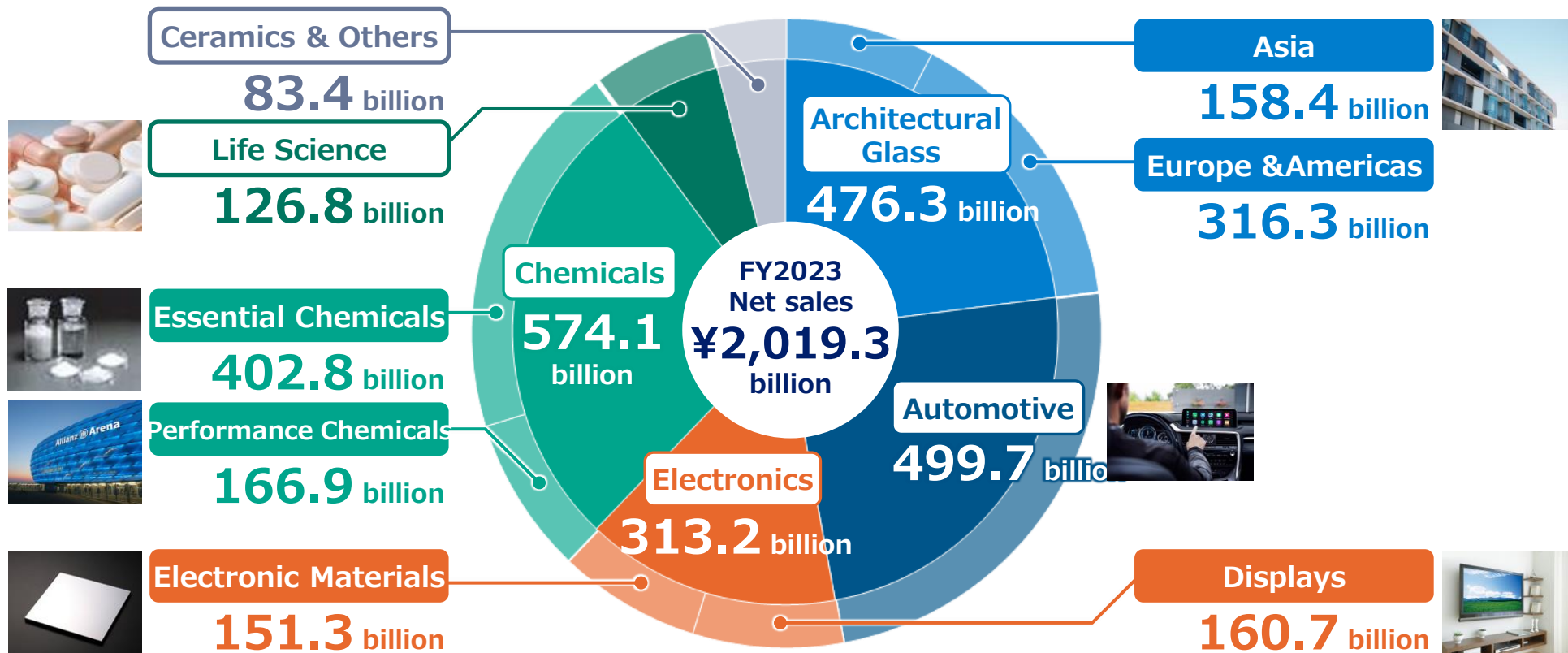
Company name	: <b>AGC Inc.</b>
TSE code	: <b>5201</b>
Established	: <b>September 8, 1907</b>
Representative director	: <b>Yoshinori Hirai</b>
Paid-in capital	: <b>¥90.9 billion*</b>
Consolidated net sales	: <b>¥2,019.3 billion*</b>
Consolidated no. of employees	: <b>56,724*</b>
No. of consolidated subsidiaries	: <b>194 companies</b> (Of which 156 are overseas)*
HQ Location	: <b>Tokyo JAPAN</b>

\* As of end-December 2023.

## Shareholder notes

■ Fiscal close	: <b>December 31</b>
■ Annual general shareholders' meeting	: <b>March of each year</b>
■ Date of record	
Annual general shareholders' meeting	: <b>December 31</b>
Year-end dividend	: <b>December 31</b>
Interim dividend	: <b>June 30</b>
■ Shareholder registry administrator	: <b>Mitsubishi UFJ Trust and Banking Corporation</b>
■ Number of shares per unit	: <b>100 shares</b>
■ Number of shares outstanding	: <b>217,434,681 shares</b>

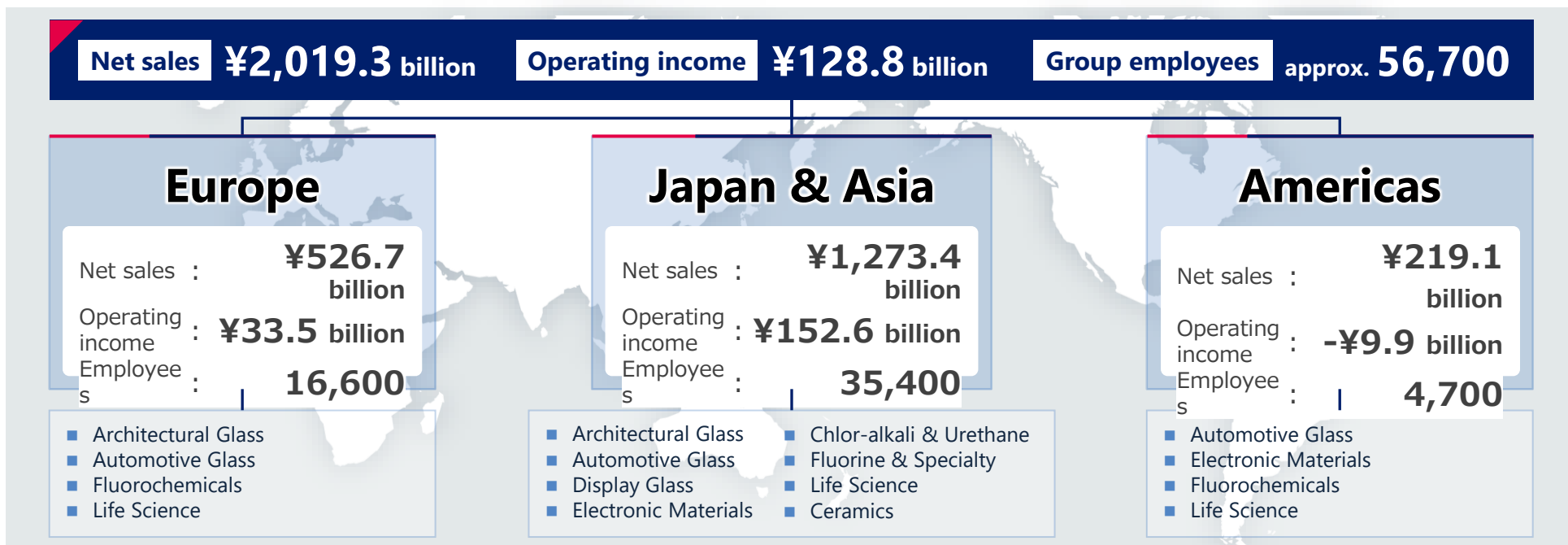
# 1. Business Overview



\* As net sales by business are before the deduction of eliminations, the sum of net sales by business does not equal Companywide net sales. Sales to external customers are used for subsegment sales

# 1. Global Operation

- Business spans over 30 countries and regions
- Approx. 70% of sales are generated outside Japan, and ratio of non-Japanese subsidiary employees is about 70%



\* Because the figures for sales and profits by region are before eliminations and common regional expenses, the sum of sales and profits by region does not correspond to the total sales and profits of the Company.

(FY12/2023)

# 1. AGC's position

- Commands the top-ranking share in many products worldwide

\*Based on AGC's estimates as of January 2024

Float glass

**Top share\***  
Worldwide



Glass substrates  
for TFT-  
LCD/OLED

**No.2** Worldwide\*



Caustic soda and  
PVC

**No.1** in  
Southeast Asia\*



Automotive glass

**Top share\***  
Worldwide



Super-thin soda  
lime glass for  
electronics

**No.1** Worldwide\*



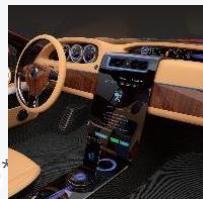
Fluorinated  
resins  
(Fluon® FTFE)

**No.1** Worldwide\*



Car-mounted  
Cover Glass

**No.1** Worldwide\*



EUV lithography  
photomask  
blanks

**No.2** Worldwide\*



Fluoropolymer  
resin for on-site  
coatings

**No.1** Worldwide\*



\*Based on fiscal 2024 estimates by AGC

# 1. AGC glass and mirror for CSP /Top share

## High transmission solar glass mirror



### SunMax Premium Reflect Thin

#### Applications

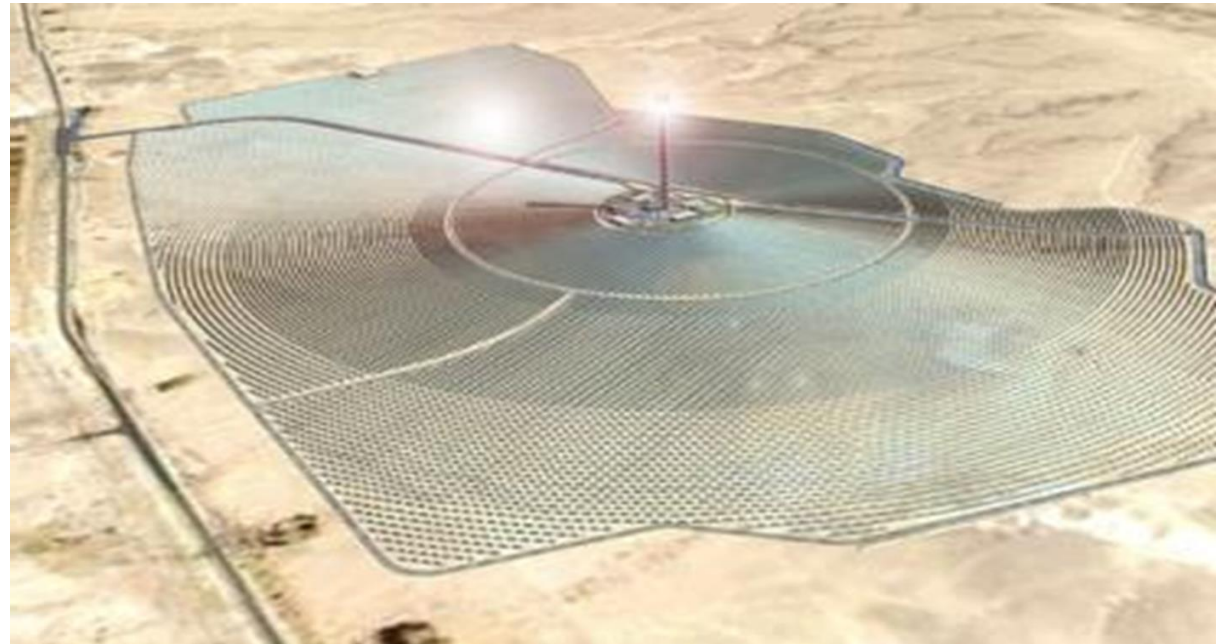
- Dish/engine
- CPV
- Parabolic trough
- Power tower





# 1. AGC CSP glass/mirror supply examples

- Cerro Dominador -Chile Atacama Desert – 110 MW
- Ashalim -Israel Negev Desert – 121 MW
- DEWA project - Dubai – 700 MW
- Redstone – South Africa : - 100 MW



**Ashalim - Israel Negev Desert**



## 2. CSP : Concentrated Solar Power



### Mechanism and features

1. Collect solar thermal energy by mirror
2. Thermal energy make vapor, it turns a turbine, which produces electricity.
3. Thermal energy also can be stored in thermal energy storage system (TES).
4. The stored thermal energy can generate electricity even at night.



**Better dispatchability, higher quality and less cost green electricity."**

# 2. About CSP types

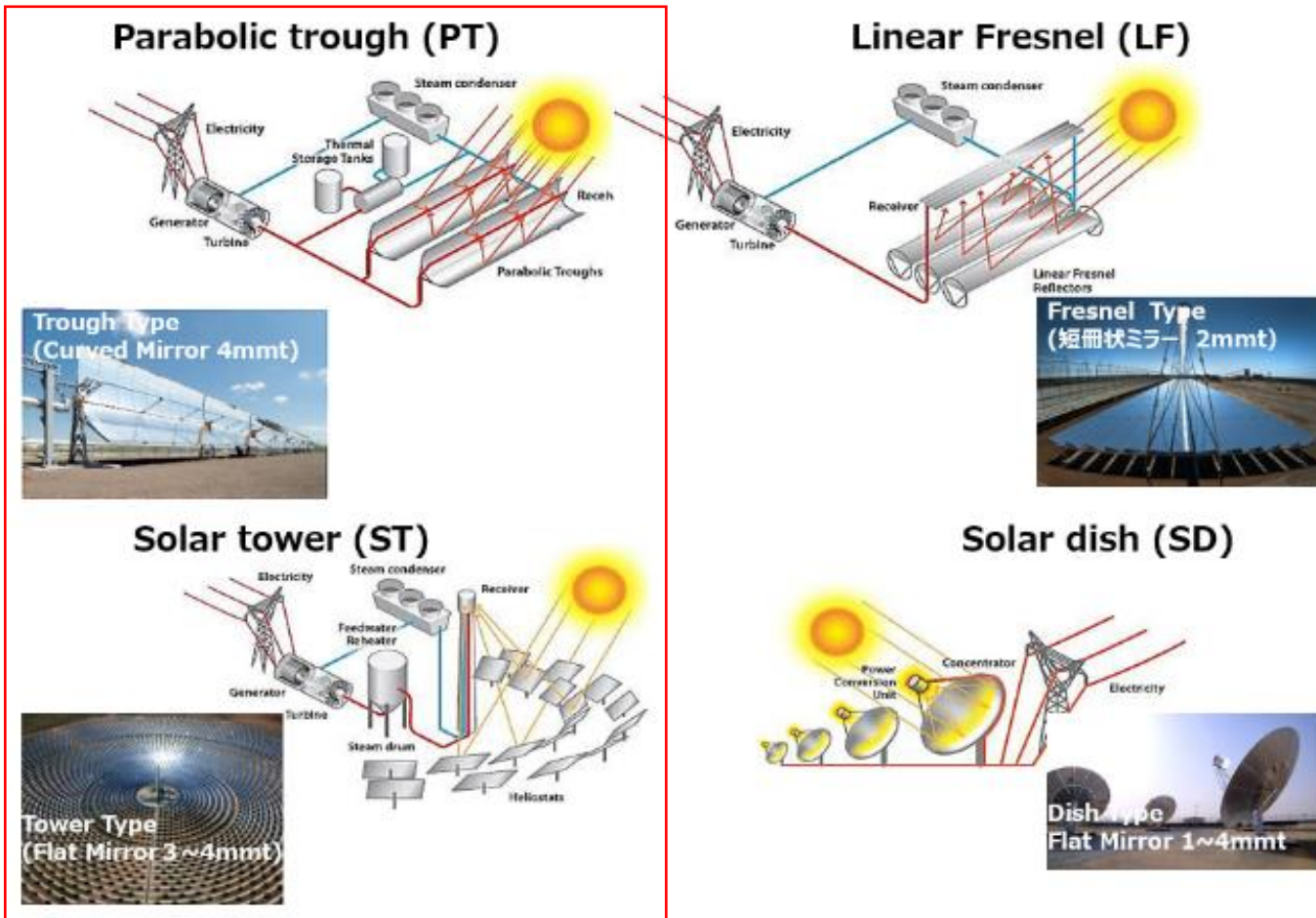
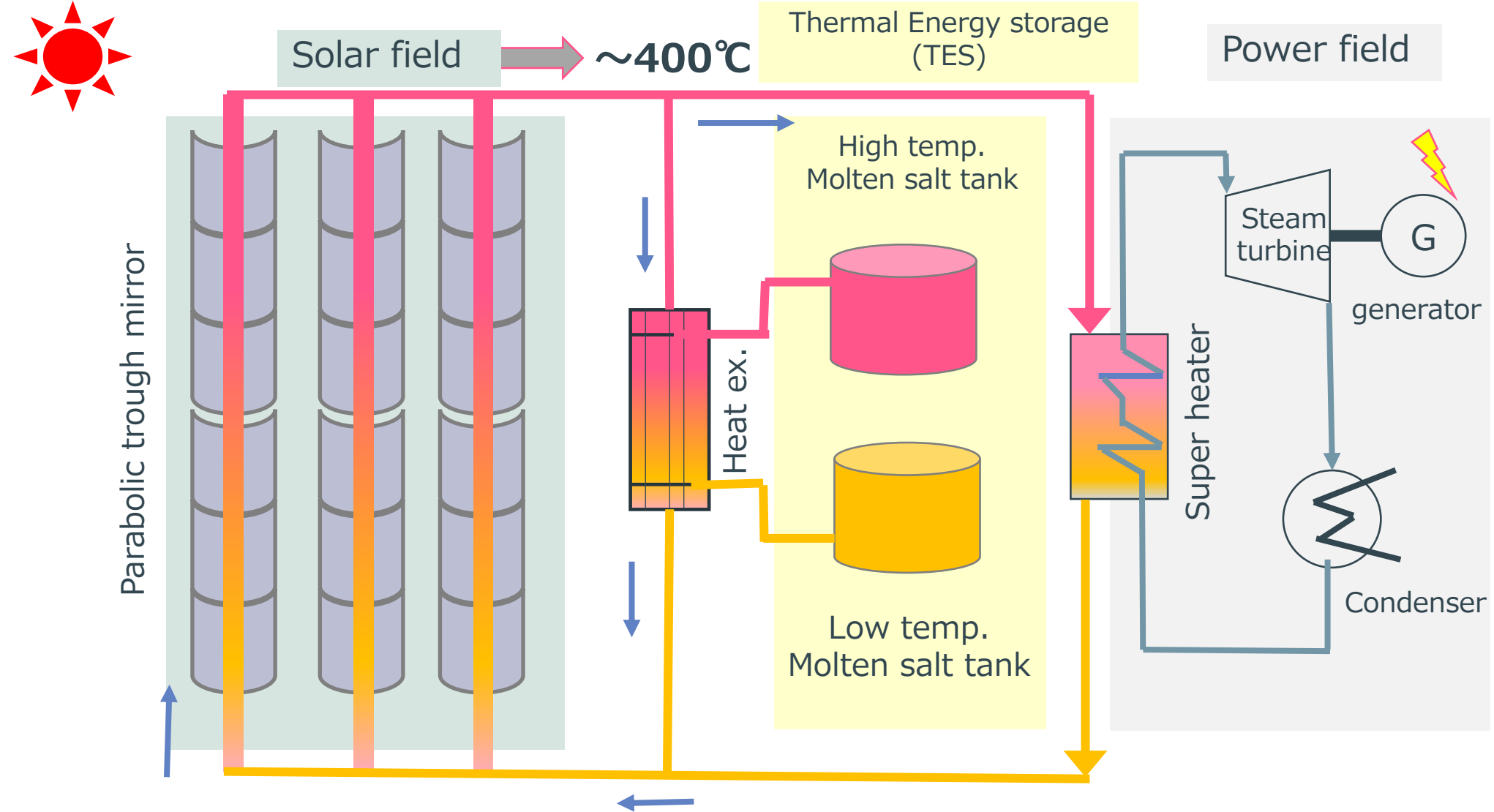


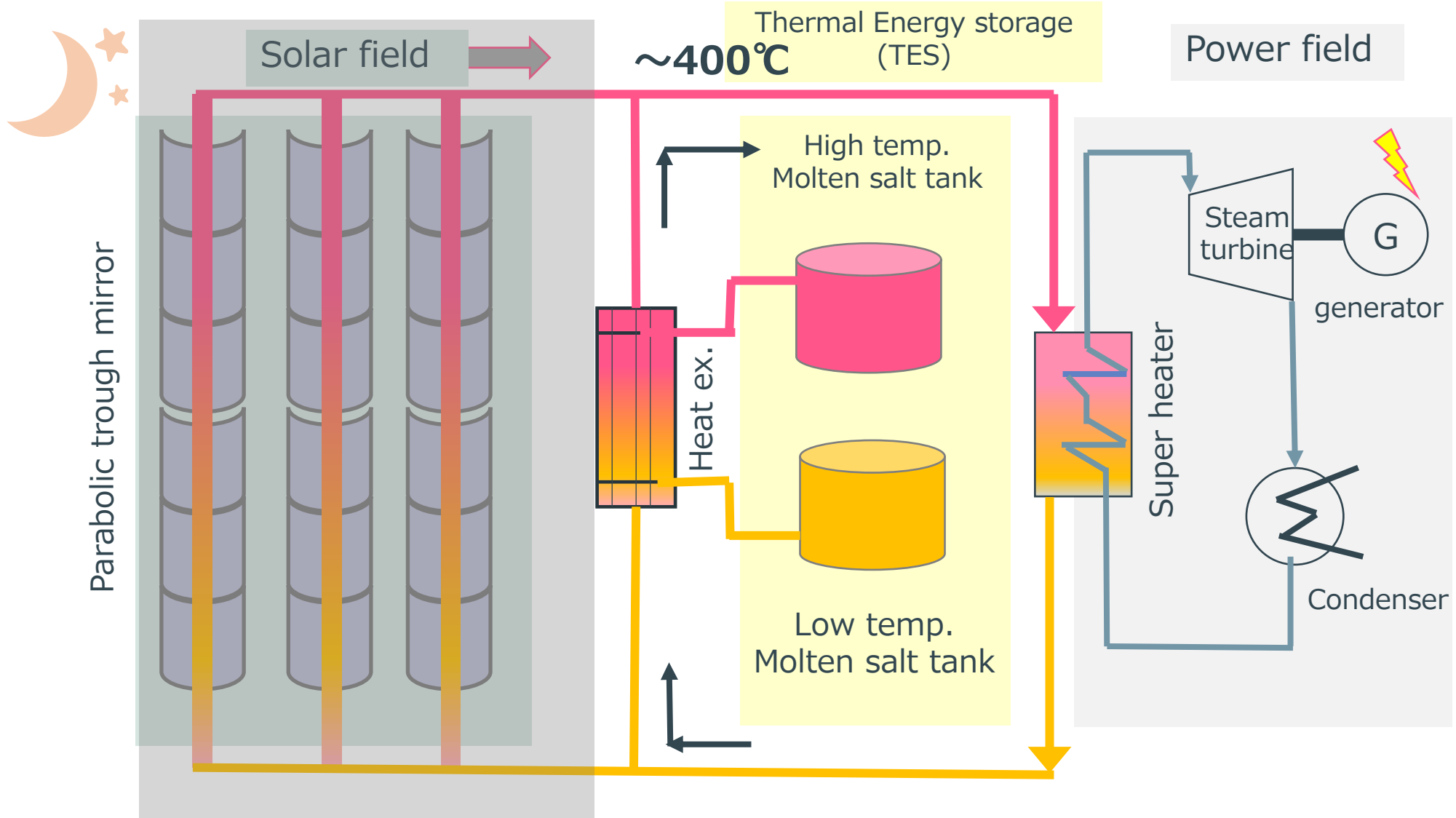
Fig. <https://www.nedo.go.jp/content/100544820.pdf>

- PT is the most widespread : lower initial cost, for small –medium scale
- ST is recently increasing : Higher efficiency, initial cost, for large scale

## 2. CSP with thermal energy storage (TES) technology Daytime



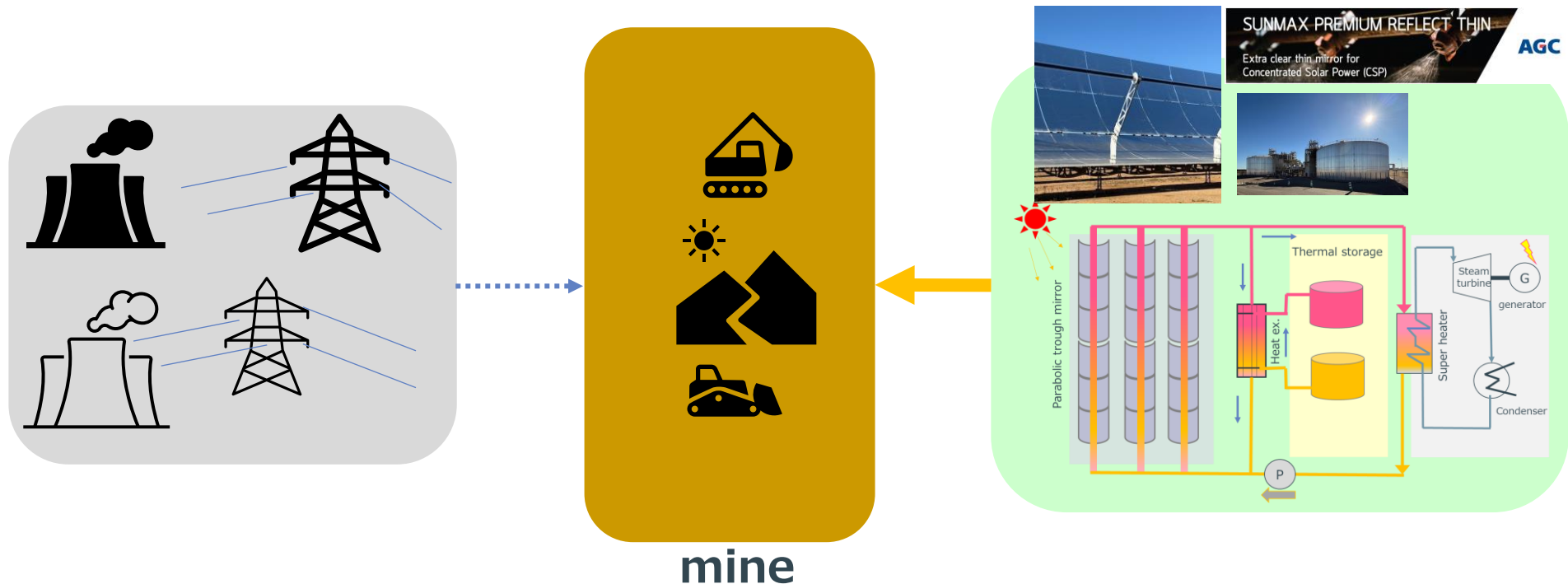
## 2. CSP with thermal energy storage (TES) technology Night



# 3. Summary of this FS

“We are considering to issue JCM credit from GHG emission reduction in mining industry by converting conventional energy to renewable energy by installing small scale concentrated solar power plant with **our latest high transmission thinner solar glass mirror** and thermal storage.

⇒ “Self-power generation and Self-consumption at mine”



### 3. FS Implementation system and Main purpose of the FS



- ① Research and analysis of trends in related policies and systems related to the UNFCCC and mining industry.
- ② Market situation of CSP and related market.
- ③ Consideration of issues and countermeasures for commercialization and JCM.
- ④ Calculation of GHG emission reductions due to the introduction of CSP and consideration of JCM methodology.
- ⑤ Coordination for commercialization through sharing proposed technologies/products, business plans, issues, and countermeasures with government officials of partner countries.

# 3. Background / Motivation of the FS

- Government renewable energy policy and target
  - e.g.
    - 「La Estrategia Climática de Largo Plazo (ECLP) 」  
Renewable energy >80% by 2030
    - 1GW CSP by 2028 (MOE)
- Mining company trends / situation
  - Green mining, ESG consideration
  - **24h/ 7 d operation**
  - Rising **electricity prices**
  - Having suitable location and land
- Northern part of Chile
  - **Strong sunshine** : High Direct Normal Irradiation (DNI)  
→ Though CSP is not common so far in Chile.
- Related technology
  - **Thin High transparency mirror**
  - Thermal Energy Storage system technology have been matured

**Expect  
Expanding  
CSP  
Market in  
Chile**

(Focusing  
small scale CSP  
as distributed  
power sources)

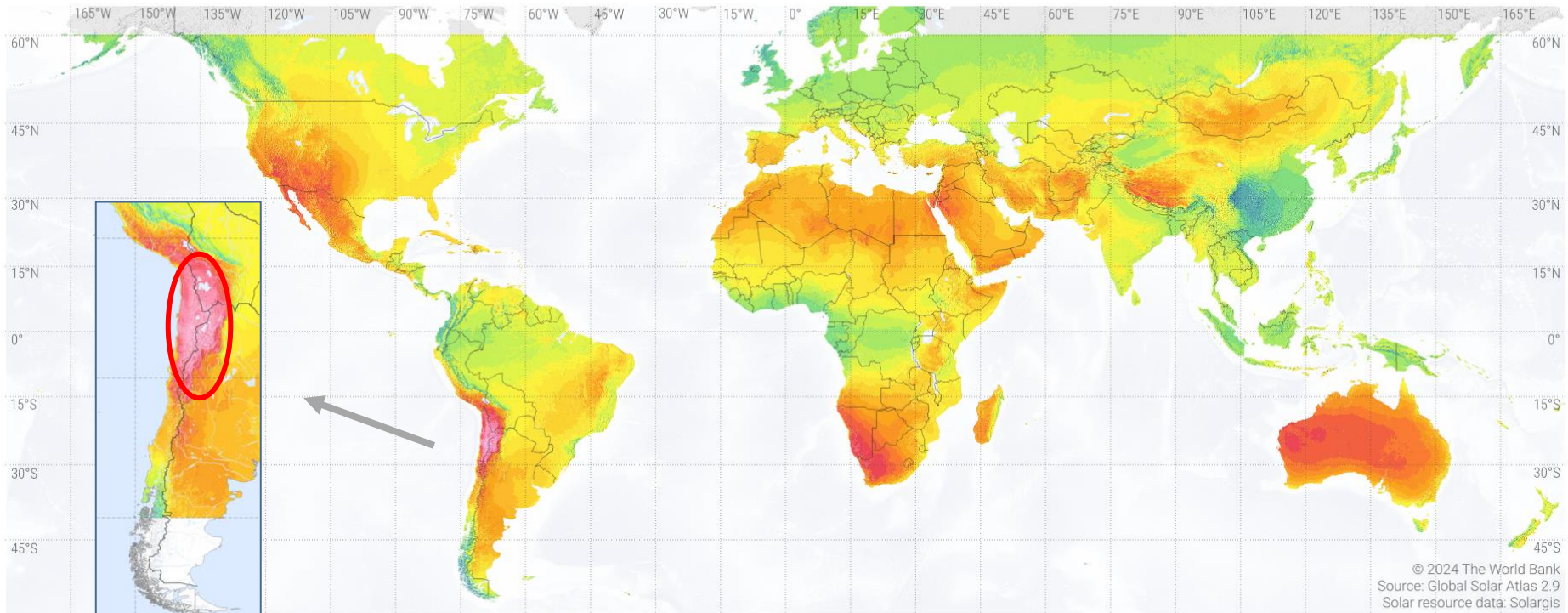


# Ref. Direct Normal Irradiation (DNI) (kWh/m<sup>2</sup>)

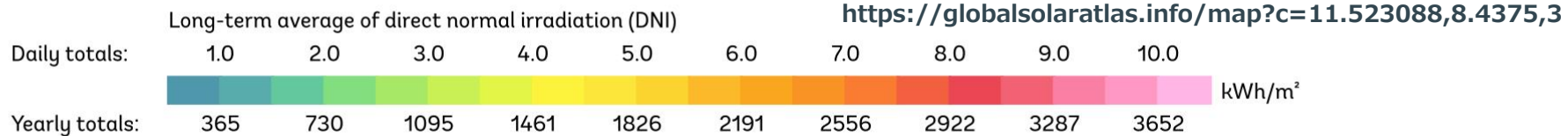
## Higher DNI is better for CSP

SOLAR RESOURCE MAP

### DIRECT NORMAL IRRADIATION



© 2024 The World Bank  
Source: Global Solar Atlas 2.9  
Solar resource data: Solargis



**North part of Republic Chile is one of the strongest DNI area.**

# 3. First field survey in September

- Visit Chilean government
  - Ministry of Energy
  - Ministry of Mining
  - Ministry of Environment

Introduction of our FS and discuss it.

→ **We received positive and informative comments.**

- Investigating one of the candidate sites for demonstration CSP



# 3. "CSP + TES" vs "PV + Battery"

- LCOE comparison for 24hrs supply

ref. 2024NREL Annual Technology Baseline (ATB) / Utility scale / Moderate scenario ~2028

CSP+TES(16hrs )  
LCOE



<

PV+Li Battery(16hrs)  
LCOE



≪

Grid electricity  
Price

- Only daytime → PV is the **cheapest** LCOE.
- CSP+TES+PV ⇒ "Hybrid" is also solution candidate

# 4. Schedule /Next step

	2024 2H	2025 1H	2025 2H	2026	2027~
This FS					
JCM demonstration program or Private sector JCM project					

- Demonstration CSP+TES will be installed by JCM program.
- We expect it to create credit and become “showcase” for the mining industry in Chile.

**END**

**Thank you for your attention.**



**AGC**

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