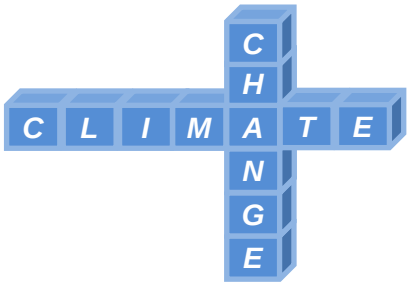
NIPPON KOEI
Challenging mind, Changing dynamics



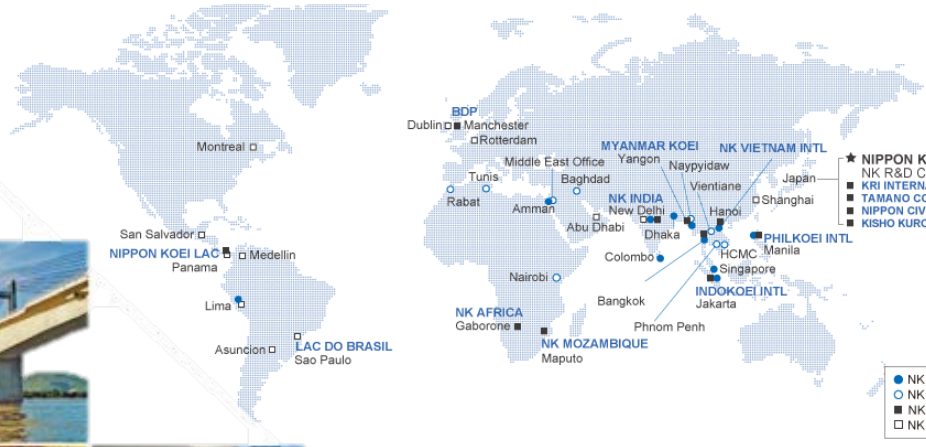
Project Development in Chile

Oct 28, 2022

NIPPON KOEI Co., Ltd.

1 NIPPON KOEI

- Nippon Koei is Japan's No.1 International Engineering Consultants.
- During 70 years, Nippon Koei has worked on over 5000 multi-disciplinary infrastructure projects in 160 countries all over the world.



2 NIPPON KOEI'S EXPERIENCES IN JCM

- Supported the project formation, methodology development and registration of the **1st JCM project in the world** (Energy Saving for Air-conditioning and Process Cooling at Textile Factory, in Indonesia)
- Supported **many new technologies** with new methodologies: Geothermal, Organic rankine cycle (ORC), micro-grid (EMS-BESS), chemical plant
- Supported **largest scale** (max subsidy) project
- Developing **hydrogen** related ideas
- Developing **CCUS** related ideas
- Developing **biomass** related ideas
  - Bio-CNG by upgrading biogas
  - Biochar
- Developed **first city-to-city project** in LATAM

	Project Study	Project Formulated	Methodology	MRV
Indonesia	Yes	Yes	Yes	Yes
Vietnam	Yes	Yes	Yes	Yes
Bangladesh	Yes	Yes	Yes	Yes
Myanmar	Yes	Yes	On going	On going
Thailand	Yes	Yes	Yes	Yes
Philippines	Yes	On going	Draft	-
Mongolia				
Chile	Yes	Yes		Yes
Mexico	Yes	Yes	On going	On going
Costa Rica	Yes			
Maldives	Yes	On going	Yes	On going
Kenya	Yes	On going	-	-
Ethiopia	Yes			

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2 NIPPON KOEI'S EXPERIENCES IN JCM

3.4MW Rice Husk Power Generation Project in Maule

PP (Japan): Asian Gateway Corporation / PP (Chile): La Gloria S.A

Outline of GHG Mitigation Activity

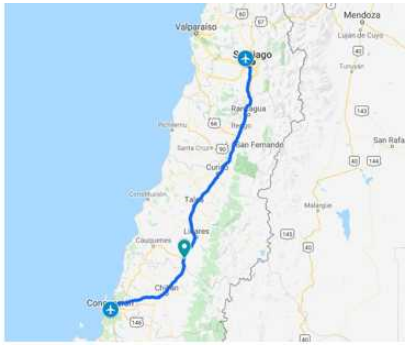
3.4 MW biomass power plant is installed in the region of Maule in Chile, which utilizes the agricultural residue such as rice husk.
The generated power is supplied to an electric company and reduces greenhouse gas (GHG) emissions by replacing the grid power.
In addition, this project prevents air pollution caused by open burning of agricultural residue.
By adopting Organic Rankin Cycle technology, which requires less water consumption, it also contributes to the climate change adaptation regarding low rainfall expected in Chile.

Expected GHG Emission Reductions

8,567 tCO2-eq./year

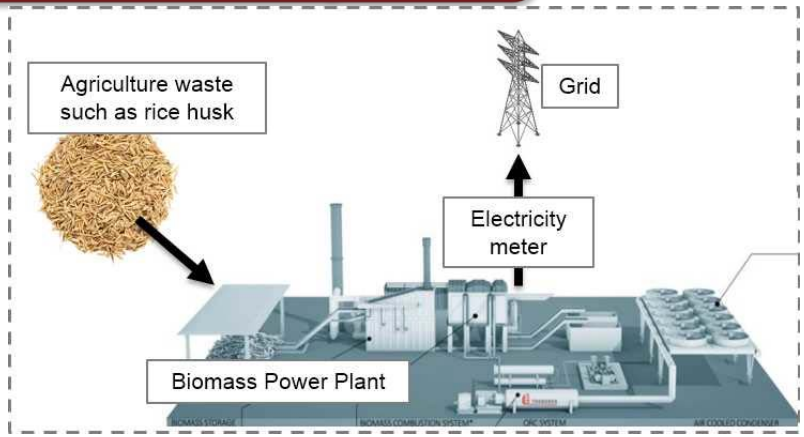
Sites of JCM Model Project

The project site is located at 347km southwest from Santiago international airport, or 127km northeast from Concepcion international airport.



Map Data ©2019 Google

Plant Image



2 NIPPON KOEI'S EXPERIENCES IN JCM

Introduction of Once-through Boiler and Fuel Switching to Tequila Plant

PP (Japan): Suntory Sprits Limited / PP(Mexico): Tequila Sauza S. de R.L. de C.V.

Outline of GHG Mitigation Activity

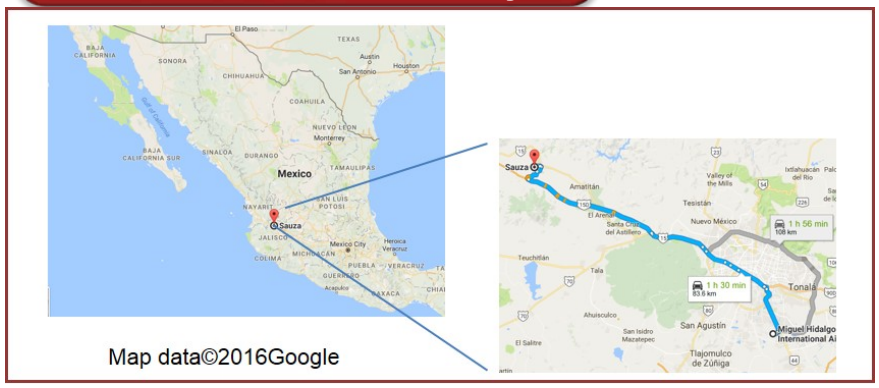
In this project**, Once-through boilers** will be installed instead of the existing fire tube boilers at Tequila Plant in Mexico. This project aims to improve boiler efficiency itself and to reduce the loss when the boilers startup and are low loading. This project also aims to reduce about 30% CO2 emission by fuel switching from oil to natural gas.

Expected GHG Emission Reductions

3,435 tCO2/year

by efficiency improvement of boiler and fuel switch

Sites of JCM Model Project



Products

3 PROJECT DEVELOPMENT IN CHILE

1. Industry in Chile

2. Energy related policy

3. Environmental concerns

3 PROJECT DEVELOPMENT IN CHILE

1. **Industry in Chile**
   a. **Mining industry:** 56% of Export
      Movement toward “Green Copper”
      Lithium production and technology
   b. **Food and beverage:** 16% of Export
      Salmon, wine, pork and etc.
   c. **Agriculture:** 8% of Export
      Fruit

- Renewable Energy
- Underground mining
- Electric/H2 Mobility
- Desalination
- Refrigeration
- Waste water treatment
- Bio gas
- Glass

3 PROJECT DEVELOPMENT IN CHILE

2. Energy related policy

a. Renewable energy target (Energía 2050)

60% by 2035, 70% in 2050

b. Coal phase out

8 coal power plants by 2024, all coal power plants by 2040 are planned to be shut down.

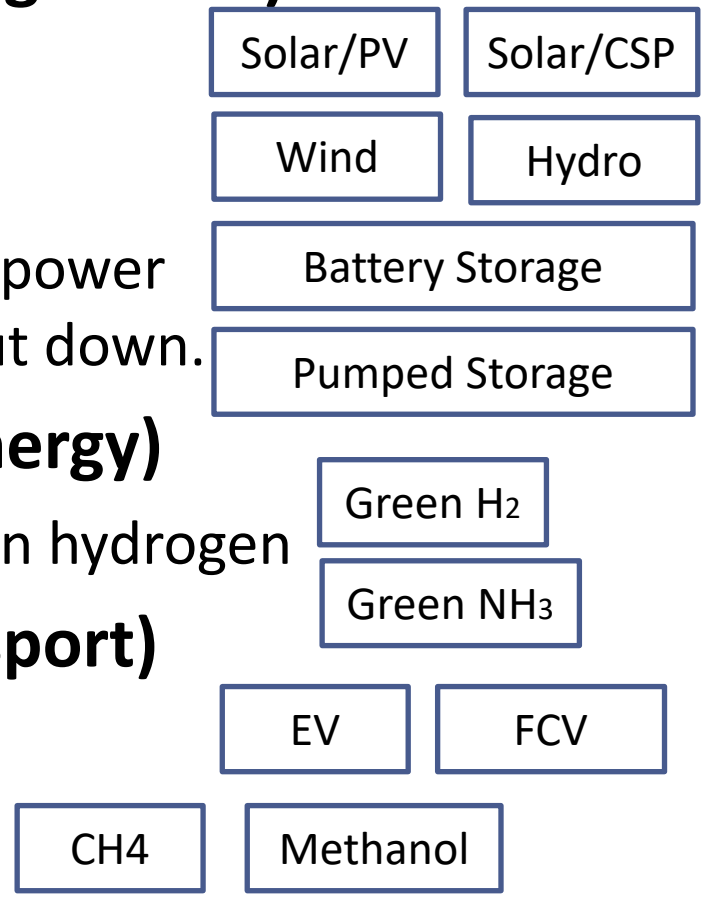
c. H2 strategy (CORFO/Min. of Energy)

Vision: Produce, use and export green hydrogen

d. Electro-mobility (Min. of Transport)

e. Race-to-zero

f. CCUS



3 PROJECT DEVELOPMENT IN CHILE

PROJECT TO PROMOTE SDGS FUTURE CITY WITH RENCA, SANTIAGO

Project Development in line with Concept of SDGs

Renca Hill

Existing green areas

Solar viewpoint

Efficient and Sustainable Irrigation

Composting Plant Nursery

More and better green areas

Elderly Mobility

Municipal E-Mobility (EV / FCV)

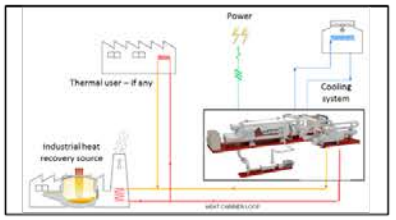
Health / Welfare

Distributed Energy

Municipal Schools PV Program

Neighborhood PV Program

Education / No Poverty



Decarbonization of Industry

ZEB/ ZEH

Solar PV

Fuel conversion for transport

Hydrogen / Ammonium use

Sustainable Industry

Environmental Value

Social Value

Economic Value

Contribution to Race-to-Zero Commitment of Renca and Green Recovery

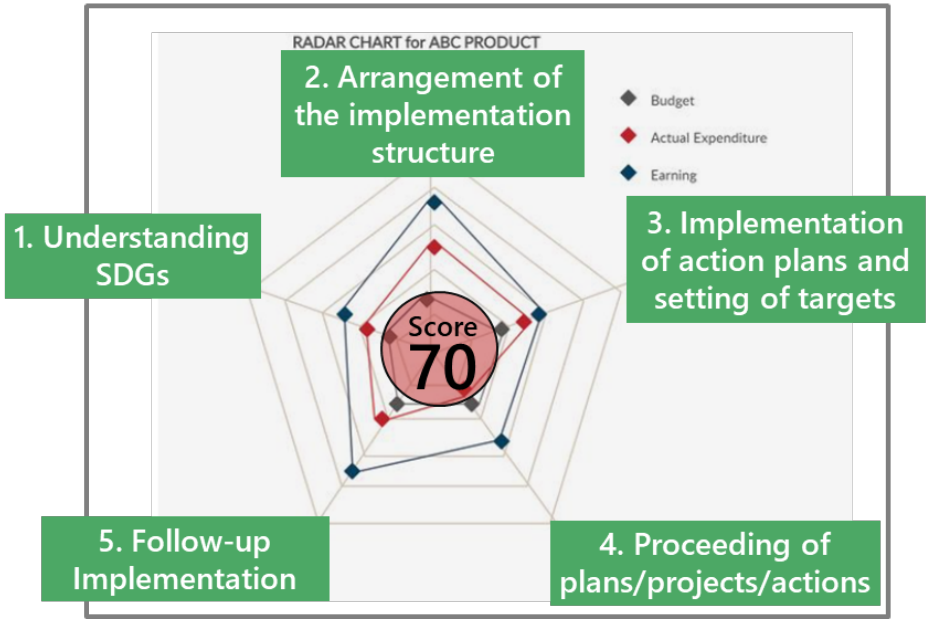
3 PROJECT DEVELOPMENT IN CHILE

TSUMUGI@ DEVELOPED BY NIPPON KOEI

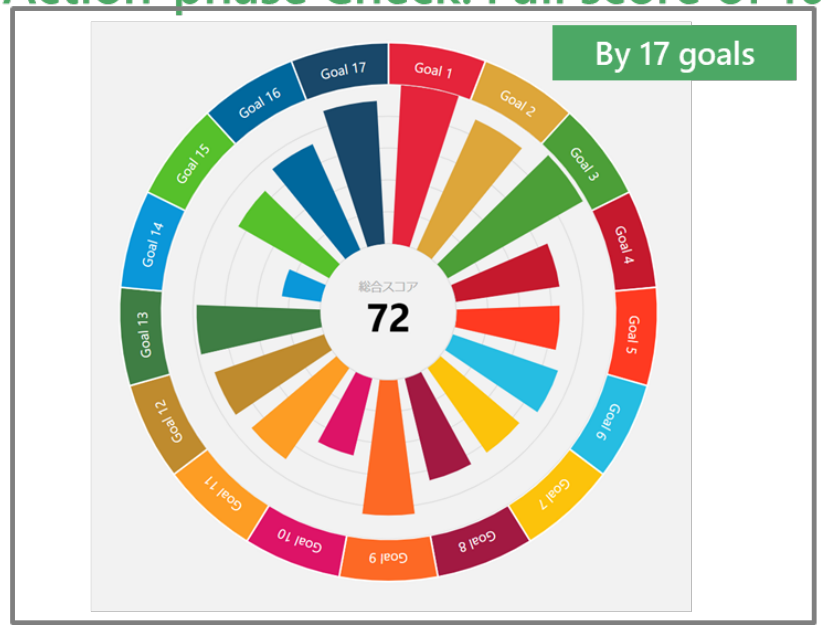
SDGs Assessment Tool for local-government

TSUMUGI@
from your city to the world

Framework Check: Full score of 100



Action-phase Check: Full score of 100



3 PROJECT DEVELOPMENT IN CHILE

3. Environmental concerns

a. **Ley REP** (Extended Producer Responsibility Law) **and waste management:**

- Tire is decided as the first priority product.
- Potential needs of Waste to Energy

b. **Refrigerant :**

Refrigerant can only be sent to Mexico for destruction

c. **Air pollution**

Burning of agricultural waste

Energy conversion from coal and oil to natural gas

4 TIPS FOR PROJECT DEVELOPMENT

To develop feasible JCM projects

1. **GHG reduction**: GHG emission reduction from energy source is necessary
2. **Maximum subsidy amount:** Smallest among "GHG reduction (tCO2/yr) x Project duration (yr) x 27 USD/tCO_2", "50% of the cost of core technology to reduce GHG", or "13.7 million USD" will apply (1USD=145JPY)
3. **Emission reduction**: Emission Factor applied for 2022 applications

	Energy Saving		Renewable Energy	
Case	Other case	Replace diesel self-generation	Others	Replace self-generation
Emission Factor	0.611	0.8	refer below	0.533

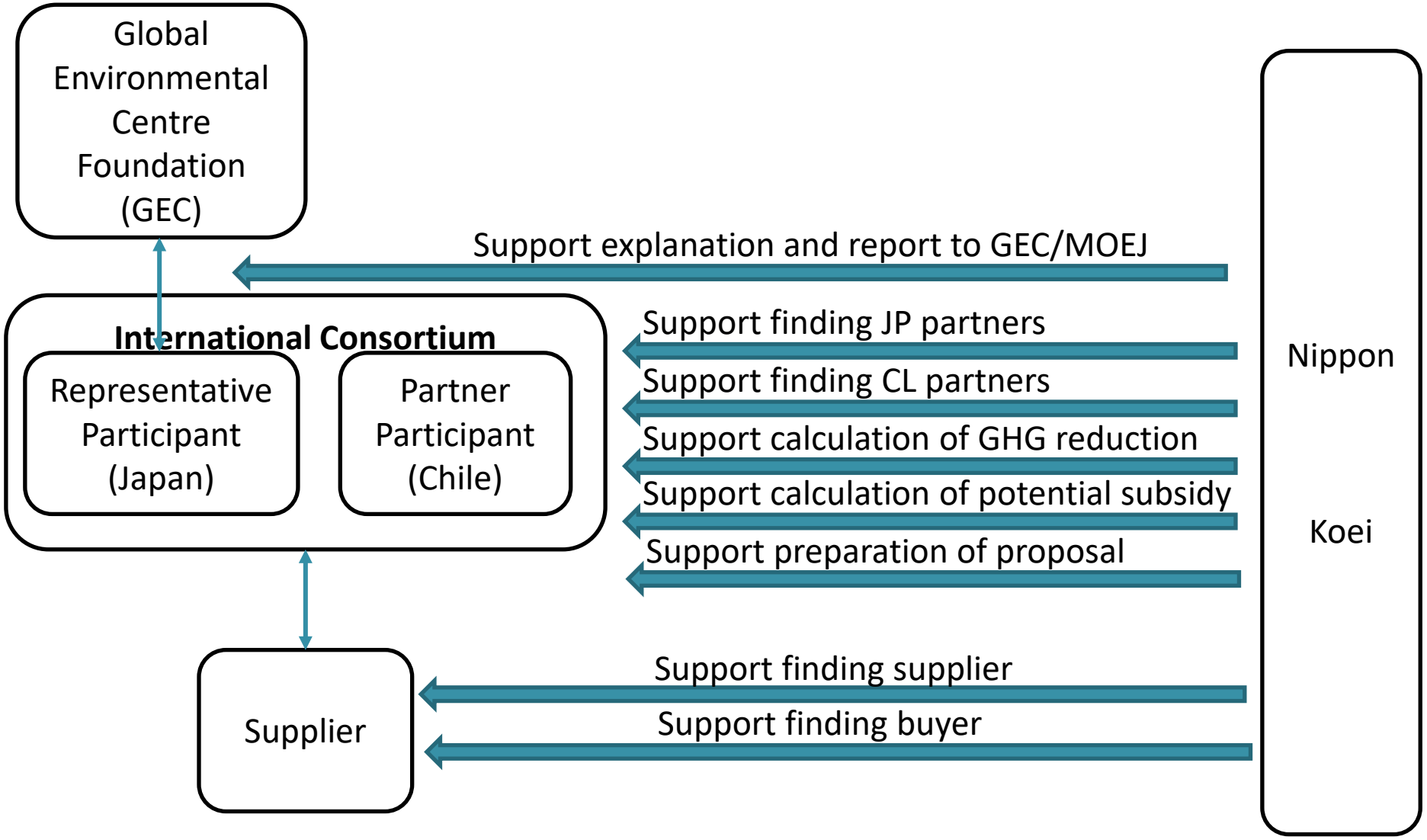
	Replace grid	Replace grid and self-generation
SEN	0.404	0.404
Aysen	0.176	0.176
Magallanes	0.361	0.361

4 TIPS FOR PROJECT DEVELOPMENT

To develop feasible JCM projects

4. **Partnering with Japanese company**: To apply JCM model project, at least one Japanese and one Chilean entity shall form an international consortium. Interested supplier is also required. (I am sorry but please be noted that some Japanese suppliers are reluctant to come to Chile…)
5. **Schedule (for 2023)**:
   - ✓ Next call for proposal: Apr-Nov 2023 (tentative)
   - ✓ Selection: 1-2 months after submission of the proposal
   - ✓ Official contract: 2-4 months after the selection (procurement can be started only after this contract), earliest Sep/Oct 2022.
   - ✓ Commissioning: At latest by the end of Jan 2025

5 CONSULTING SERVICE BY NIPPON KOEI



5 CONSULTING SERVICE BY NIPPON KOEI

Please provide following information to consult with us

1. **Project information**
   - ✓ Project duration (yr) will be set by Japanese law based on the project type with applied technology
   - ✓ Project cost with economic analysis (pay-back and/or IRR)
2. **Type of GHG reduction**
   - ✓ A) Energy saving: The original power source is from the grid or the power generated by the project owner
   - ✓ B) Renewable energy: power is injected to the grid, or is solely used for self consumption
3. **Calculation of CO_2(GHG) reduction**
   - ✓ Annually saved energy (MWh or fossil fuel amount), or
   - ✓ Annually generated renewable energy (MWh)

5 CONSULTING SERVICE BY NIPPON KOEI

Please provide following information to consult with us

4. **Project process**
   - ✓ Necessary permissions and the plan to obtain them
   - ✓ Progress of internal decision on investment for the project (possibly with the condition of receiving subsidy)
5. **Relationship with Japanese companies**
   - ✓ Japanese partner (Nippon Koei may support finding)
   - ✓ Provider for leading low carbon technologies
6. **Project schedule**
   - ✓ Project commencement is only after the official contract
   - ✓ Projects needs to be completed (start CO2 reduction) in four financial years of Japan

6 OTHER POTENTIAL SUPPORTING SCHEMES

1. **City-to-City collaboration**: Ministry of the Environment of Japan support Japanese Cities to cooperate with Chilean cities to promote the low carbon society and JCM projects
2. **Co-innovation and hydrogen**: Continuous scheme may be launched in the next year.
3. **JOIN**: Japan Overseas Infrastructure Investment Corporation for Transport & Urban Development, could be an investor for transportation and city development.
4. **METI/NEDO**: High quality infrastructure and JCM
5. **JBIC**: Japan Bank for International Cooperation

7 CONSULTING SERVICE BY NIPPON KOEI

Nippon Koei is implementing a project to formulate JCM project in Chile, funded by Ministry of the Environment, Japan up to March 2023. Besides this project, we are always engaged in the project development and implementation in Chile.

Nippon Koei staff will visit Chile during **November 2022** and **sometime (Jan-Mar) in the next year**.

Please feel free to send e-mail to following address for any consultation. I am very happy to see you directly in Chile.

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Gonzalo Diaz (Mr.), gdiaz@sherpasgroup.cl