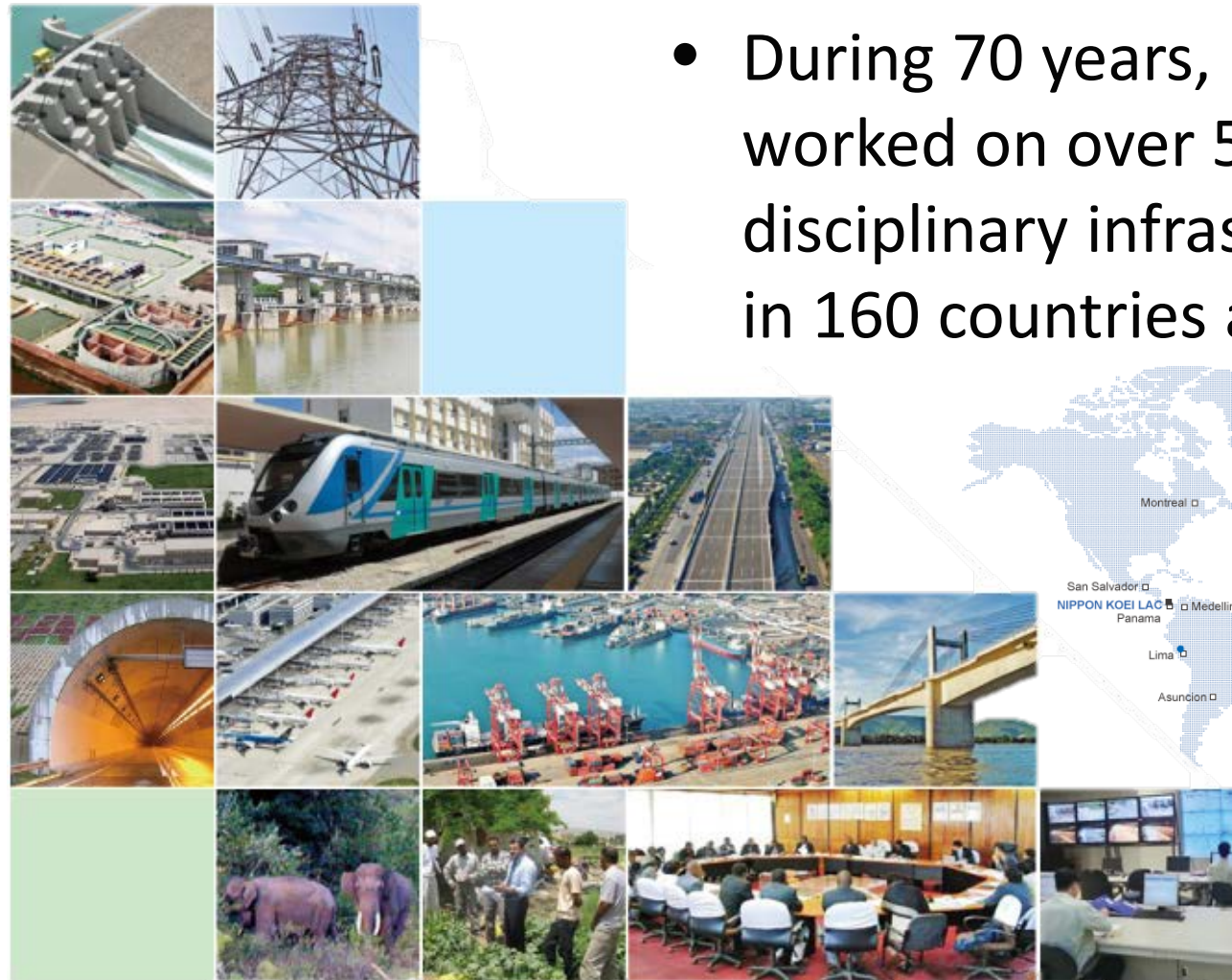


Potential of JCM Projects in Chile

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)



Introduced Technologies (examples)



- Centrifugal chiller
- Once-through boiler
- Absorption chiller
- Water pump, etc.

	Project Study	Project Formulated	Methodology	Project registration
Indonesia	Yes	Yes	Yes	Yes
Vietnam	Yes			
Bangladesh	Yes	Yes	Yes	Yes
Myanmar	Yes	Yes	On going	On going
Thailand	Yes	Yes	Yes	On going
Chile	Yes			
Mexico	Yes	Yes	On going	On going
Costa Rica	Yes			
Maldives			On going	On going
Kenya	Yes			
Ethiopia	Yes			

2 NIPPON KOEI'S EXPERIENCES IN JCM

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

PP (Japan): Suntory Spirits 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.

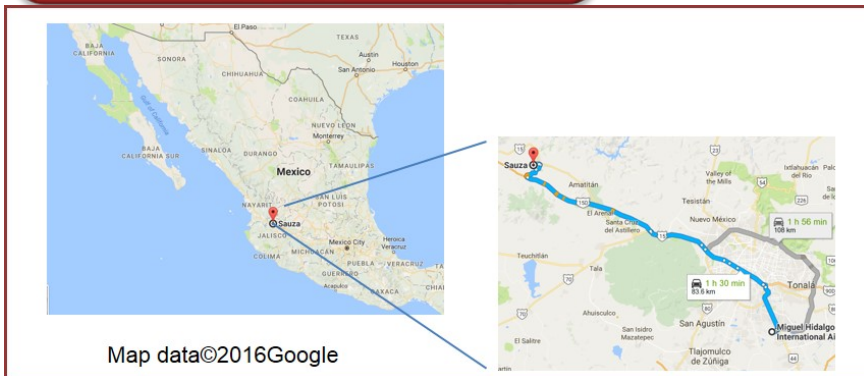


Expected GHG Emission Reductions

3,435 tCO₂/year

by efficiency improvement of boiler and fuel switch

Sites of JCM Model Project



Map data©2016Google

Products



NIPPON KOEI

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: 56.1% of Export

Movement toward “Green Copper”

Lithium production and technology

b. Food and beverage: 16.7% 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)

Solar/PV

Solar/CSP

Wind

Hydro

Battery Storage

Pumped Storage

Green H₂

Green NH₃

EV

FCV



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:** From fossil fuel combustion needs to be reduced, and more than 1,000 tCO₂/yr reduction (indicatively) is expected
2. **Maximum subsidy amount:** Smallest among “GHG reduction (tCO₂/yr) x Project duration (yr) x 35 USD/tCO₂”, “50% of the cost of core technology to reduce GHG”, or “18 million USD” will apply
3. **Emission reduction:** Emission Factor applied in 2019

	Energy Saving		Renewable Energy	
Case	Other case	Replace diesel self-generation	Others	Replace diesel self-generation
Emission Factor	0.6138	0.8	refer below	0.533

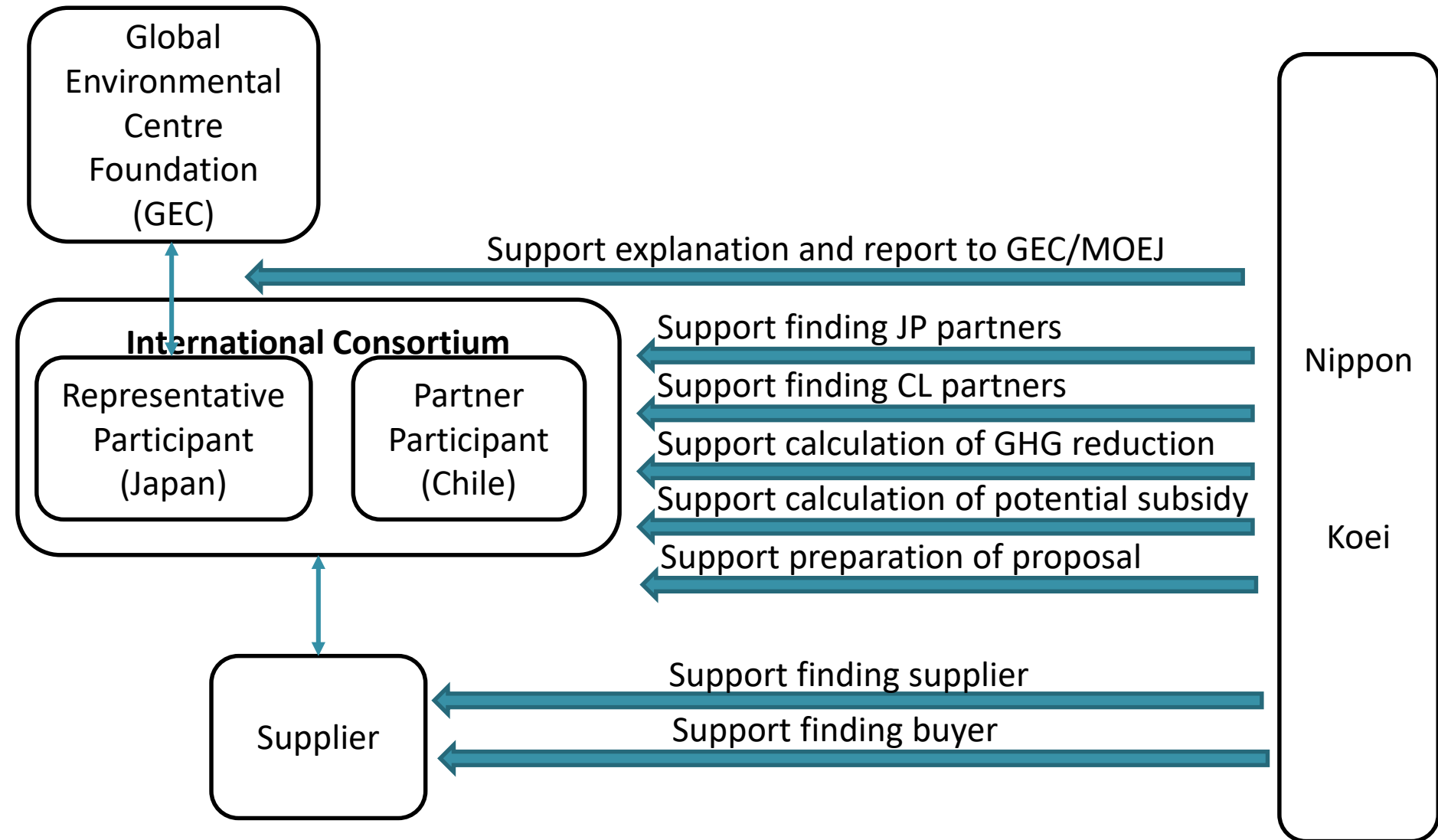
	Replace grid	Replace grid and self-generation
SIC	0.314	0.314
SING	0.718	0.533
Aysen	0.200	0.200
Magallanes	0.361	0.361

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 2020):**
 - ✓ Next call for proposal: Apr-Nov 2020 (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 2020.
 - ✓ Commissioning: At latest by the end of Jan 2024

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 CO₂(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:** Low-Carbon Technology demonstration for localization as well as the contribution to co-innovation.
3. **JOIN:** Japan Overseas Infrastructure Investment Corporation for Transport & Urban Development, could be a investor for transportation and City-to-City building.
4. **JICT:** Fund Corporation for the Overseas Development of Japan's ICT and Postal Services (Japan ICT Fund)
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 2020.

Nippon Koei staff visit Chile one or two more times and our local support staff in Chile is always available.

Please feel free to send e-mail to following address for any consultation.

SAITO Tetsuya (Mr.), saito-tt@n-koei.jp

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