



F-gas Recovery & Destruction Project in Vietnam

Supported by Ministry of Environment Japan

Marubeni Corporation
10th October 2019

■ 1. COMPANY PROFILE

- ◆ Company Profile
- ◆ The Marubeni Group by Numbers
- ◆ Global Network

Company Profile

● Founded	May 1858
● Incorporated	December 1, 1949
● President and CEO	Masumi Kakinoki
● Paid-in Capital	262,686 million yen
● Head Office	Tokyo Nihombashi Tower, 7-1, Nihonbashi 2-chome, Chuo-ku, Tokyo, 103-6060, Japan
● Number of Branches and Offices (Including Tokyo Head Office)	136 branches and offices in 67 countries and regions, consisting of 12 domestic branches and offices, 57 overseas branches and offices and 29 overseas corporate subsidiaries with 67 offices
● Number of Employees* (non-consolidated)	4,418 (Excluding 432 local employees of overseas branches and offices and 1,468 local employees of overseas corporate subsidiaries)
● Number of Employees* (consolidated)	42,882
● Number of Consolidated Companies	431



(As of April 1, 2019 , except * as of March 31, 2019)

The Marubeni Group by Numbers

Marubeni Group

Number of Bases
136 branches/offices in
67 countries/regions

*Including Japan, as of April 1, 2019

Number of Consolidated Companies

431



Number of Group Employees

42,882



Company Employees Positioned Overseas

894



Helena Agri-Enterprises, LLC

Nationwide Network in the United States.

Approx. **500** locations

Helena is the No.2 retailer of crop protection products, fertilizers, and seeds in the United States.

Volume of Coffee Beans Traded

30% of
Coffee Consumed in Japan

Approximately 470,000 tons of coffee are consumed in Japan each year. Marubeni handles approximately 30% of this volume.

* Achievements in 2017

Number of LNG Vessels Owned

16 LNG vessels

Marubeni is currently in possession of 16 out of all operational LNG vessels around the world. The total number of LNG vessels in existence globally is 512 (as of March 2019; this number excludes small model vessels and FSRU).

Copper Equity Volume

150,000 tons

Conducting copper mining business in Chile. Equity volume is one of the largest in Japan.

Number of Aircrafts Owned & Managed

274 aircrafts

Marubeni commenced investment in Aircastle Limited in 2013, and we are now leasing aircraft to 81 airlines in 44 countries worldwide through this company.

Global Olefin Trading Market

Approx. **30 %** share

Using specialized tankers, Marubeni has secured approximately 30% of the global olefin trading market.

Net Power Generation Capacity

12,003 MW

As a leading Independent Power Producer (IPP), Marubeni has world class net power generation capacity.

* The total sum of Japan and overseas

Provision of Housing in China

Approx. **11,000** units

Marubeni was one of the first Japanese companies to enter into the Chinese real estate market and has been engaged in such business operations as the development of housing for Chinese homebuyers and complex facilities since 1985.

People Served by Marubeni's Water Business

Approx. **13.5** million people

Marubeni is conducting diversified water projects mainly in Central & South America, Asia, the Middle East, and Europe.

*The target population of a total of 4 concession services this company owns in Europe, South America and Asia.

Afforestation Business Sites

190,000 hectares

2 projects managed in 2 countries with a total of 190,000 hectares (roughly the size of Tokyo).

*Leading site area among Japanese companies

Grain Trading

Industry No.1 Trading volume **70** million tons

Marubeni boasts the top grain trading volume among Japanese companies.

*Includes some double-counted trades
*As of March 2018

Global Network



●Locations

North & Central America

Guatemala City
Houston
Los Angeles
Mexico City
New York
Omaha
Queretaro
Silicon Valley
Toronto
Vancouver
Washington, D.C.

South America

Bogota
Buenos Aires
Caracas
Habana
Lima
Rio de Janeiro
Salvador
Santiago
São Paulo

Europe & CIS

Almaty
Astana
Athens
Bucharest
Budapest
Düsseldorf
Hamburg
Khabarovsk
Kiev
London
Lisbon

Milan
Moscow
Paris
Prague
Risley
Tashkent
Vladivostok
Warsaw
Yuzhno-Sakhalinsk

Middle East & Africa

Abidjan
Abu Dhabi
Accra
Addis Ababa
Algiers
Amman
Ankara
Baghdad
Cairo
Casablanca
Doha
Dubai

Istanbul
Johannesburg
Kuwait City
Lagos
Luanda
Maputo
Muscat
Nairobi
Riyadh
Tehran

Southwest Asia

Chennai
Chittagong
Dhaka
Goa
Islamabad
Karachi
Kolkata
Lahore
Mumbai
New Delhi

ASEAN

Bangkok
Hanoi
Ho Chi Minh City
Jakarta
Kuala Lumpur
Kuching
Manila
Nay Pyi Taw
Phnom Penh
Quang Ngai
Singapore
Vientiane
Yangon

China / East Asia

Beijing
Changchun
Chengdu
Dalian
Guangzhou
Hefei
Hong Kong
Kunming
Nanjing
Qingdao
Seoul
Shanghai
Shenzhen
Taipei

Tianjin
Ulan Bator
Wuhan
Xiamen

Oceania

Auckland
Melbourne
Perth
Sydney
Port Moresby

Japan

Sapporo
Sendai
Tokyo
Shizuoka
Hamamatsu
Nagoya
Osaka
Fukuyama
Hiroshima
Imabari
Fukuoka
Naha



2. EXPERIENCE FOR CARBON BUSINESS

(INCLUDING F-GAS DESTRUCTUION PROJECT)

○ Experience for Carbon Business

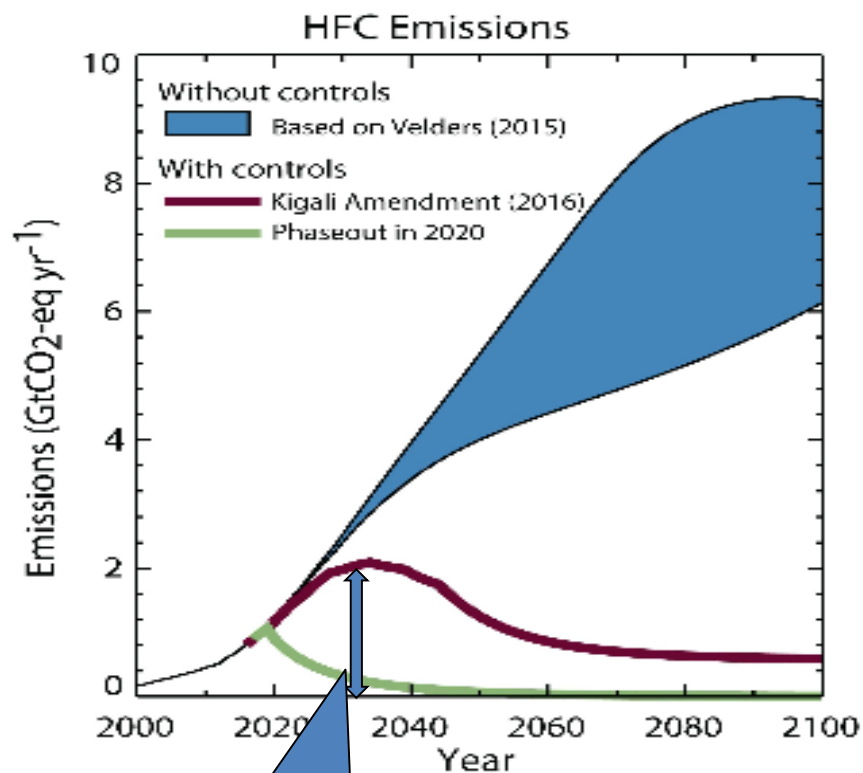
- Emission Trade : **Over 100 Million Tons**
(During the first commitment period of the Kyoto Protocol)
- FS and Demonstration Project in JCM system : **more than 10 Projects**
For example,
 - REDD + demonstration project in Lao PDR (FY2015-2017)
 - F-gas Recovery & Destruction Project in Vietnam(from FY2018)
- J-Credit Trade : **about 400,000 tons (FY2018)**
(about 40% share in Japan)
- F-gas Decomposition Project In China
Registered as CDM project
Issued CERs about 40 million tons



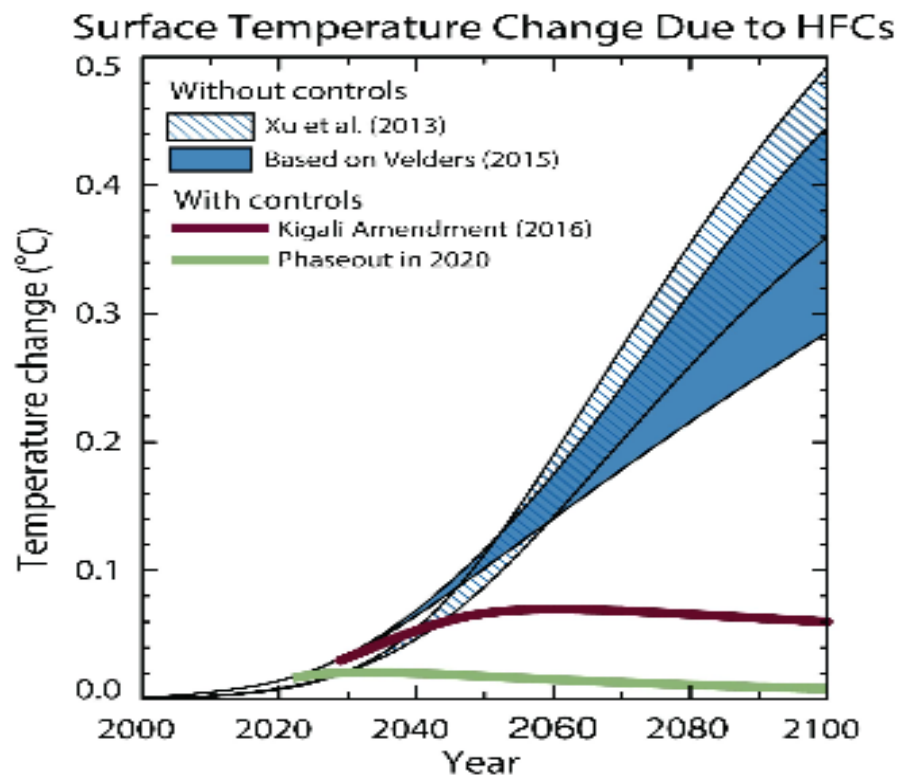
Photo of HFC decomposition Project In china
(HFC23 decomposition project of Zhejiang Juhua Co., Ltd)

■ 3. IMPORTANCE OF F-GAS RECOVERY AND DECOMPOSITION

○ Why F-gas Recovery and Decomposition is so important?



Estimated Emission in 2030 :
2GtCO₂-eq
It's 1.5 times the amount of
Japanese yearly emissions



Source from
Scientific Assessment of Ozone Depletion: 2018 EXECUTIVE SUMMARY

■ 4. PROJECT OVERVIEW

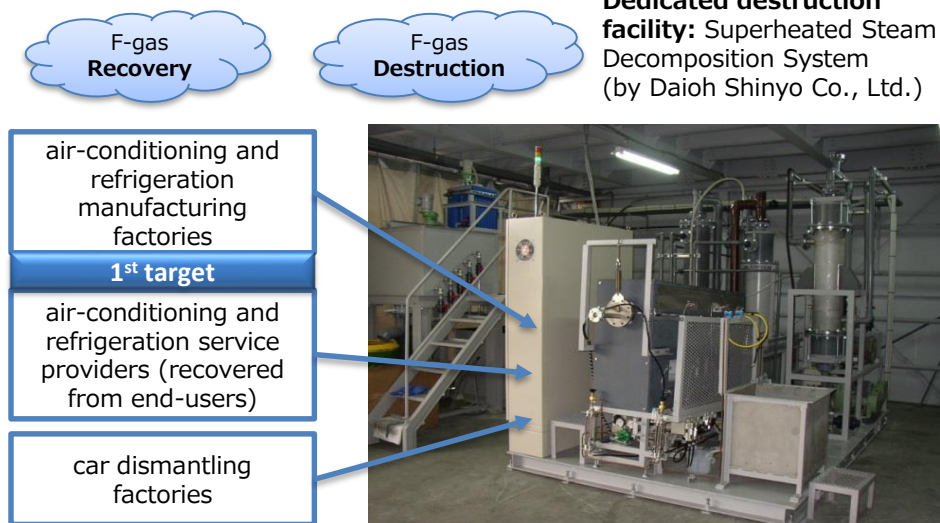
- ◆ Project Overview
- ◆ Implementation Scheme
- ◆ Detail 1: Recovery & Destruction Activity
- ◆ Estimated Volume Project Overview
- ◆ Detail 2: JCM Registration
- ◆ Detail 3: Policy Proposal & Capacity Building
- ◆ Project Schedule

○ Project Overview

Outline of GHG Mitigation Activity

- In Vietnam, there is no regulation for high GWP F-gas recovery and destruction as for now, therefore F-gas filled in air-conditioning, refrigeration and car is finally released to the atmosphere. Dissemination of these products in Vietnam will effect on global warming.
- In this model project supported by Japanese government, demonstration project for F-gas recovery and destruction to align with JCM formulation will be implemented.
- Capacity building for sustainable recovery destruction scheme is also included in this project.

Project Outline

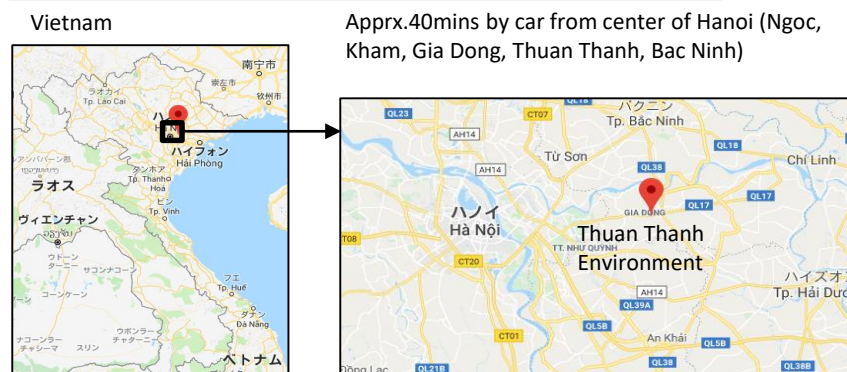


Expected GHG Reductions

6,500tCO₂-eq./year *Average during 2020 – 2025)

- **Reference scenario**
GHG emission from F-gas emitters will be continued.
- **Project scenario**
By F-gas recovering and destroying, F-gas emission to the atmosphere will be prevented.

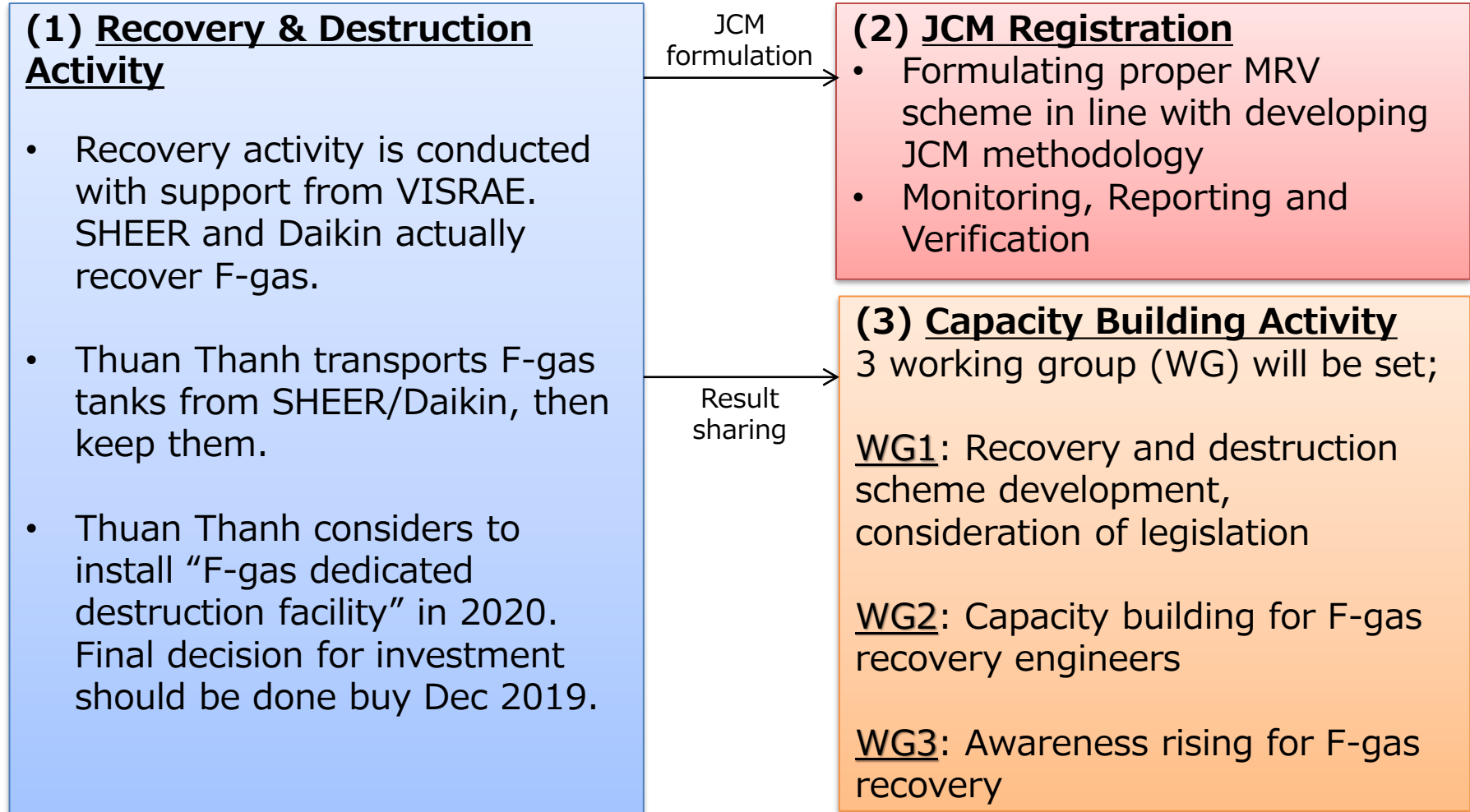
Site of Project (Destruction Site)



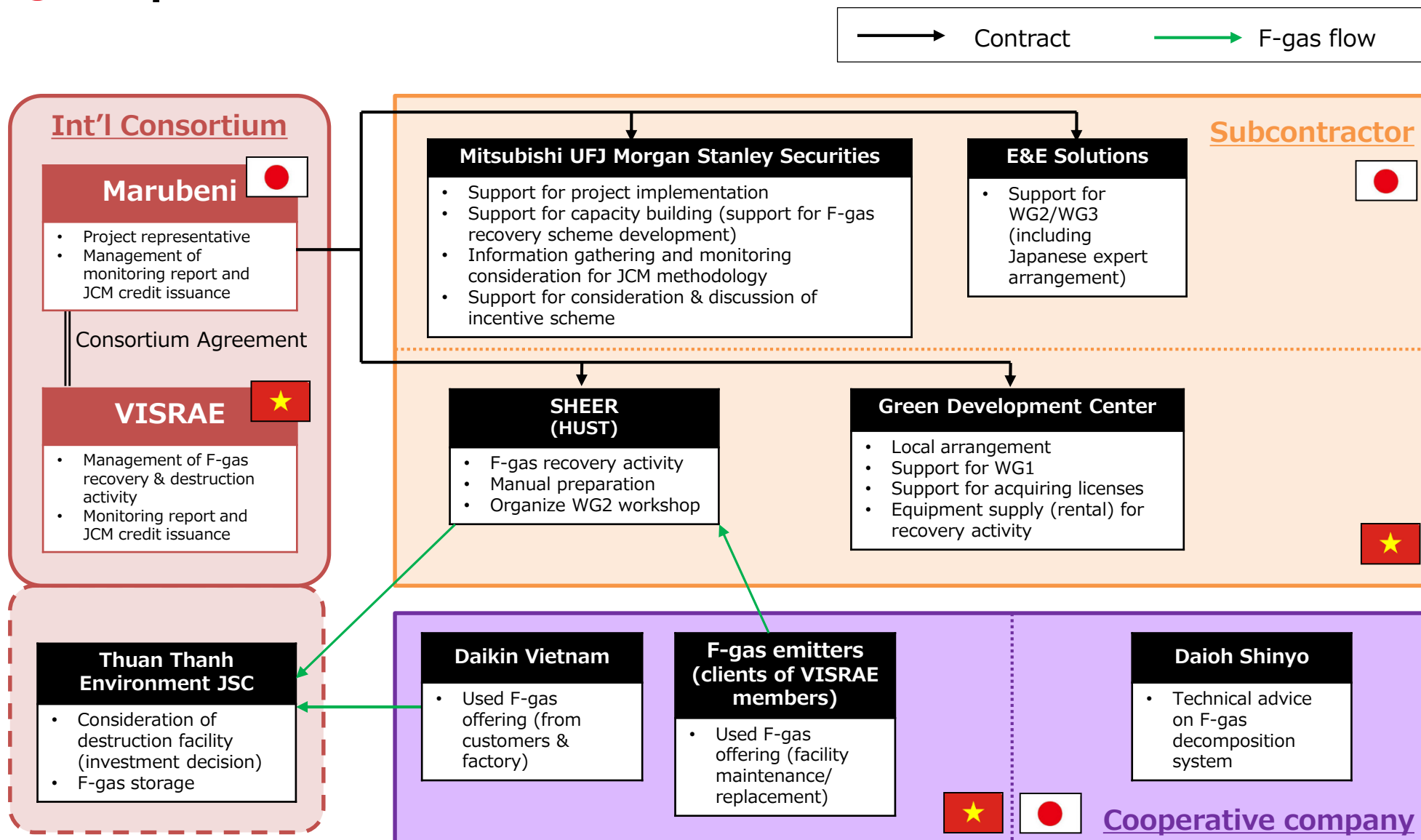
Source: Google map

○ Project Overview

- In FY2019-2020 (by March 2021), our project activity is divided into following 3 parts.



○ Implementation Scheme



○ Detail 1: Recovery & Destruction Activity

- **Recovery activity**

1. SHEER recovers from clients of VISRAE members

VISRAE members share their clients' maintenance/replace plan, then SHEER recovers F-gas from them.

2. Daikin recovers from its clients and factory

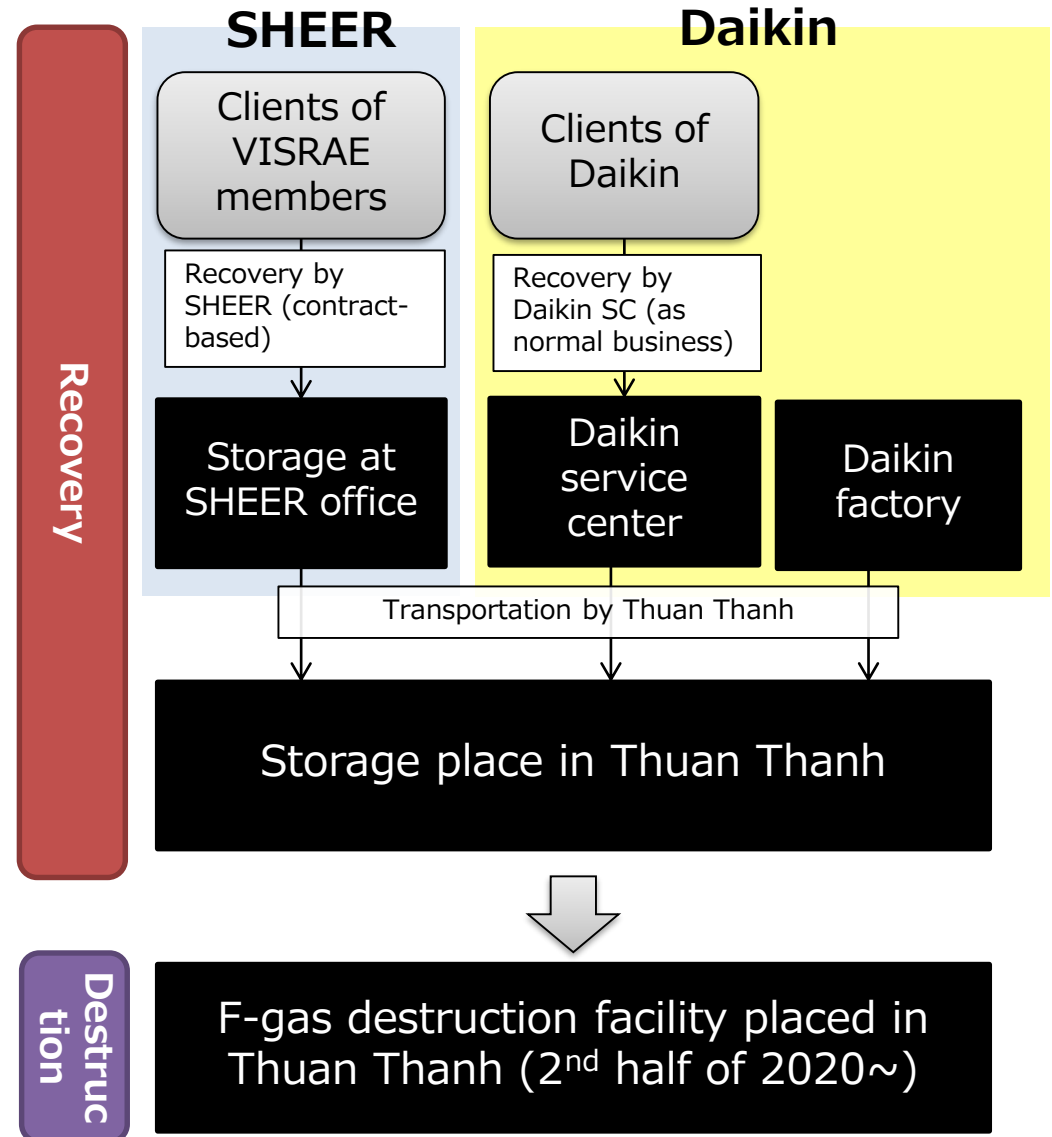
1. Service center recovers used F-gas from their clients as normal business. These F-gas are to be provided for this project.

2. Daikin factory provides used F-gas from their production line and QC process.

- **Destruction activity**

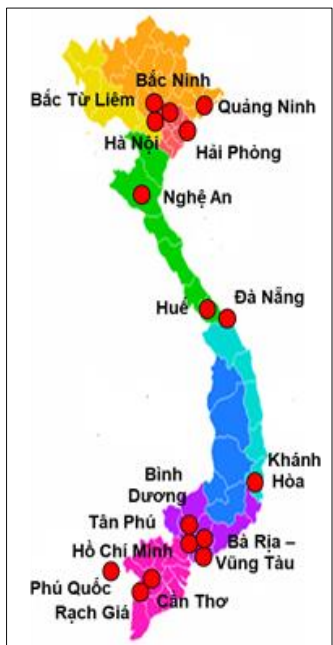
1. Thuan Thanh destroys F-gas by the dedicated F-gas destruction facility

Detail plan for facility introduction is to be discussed during 2019.



○ Estimated Recovery Volume (KG)

Refrigerants	Recoverd by	2019	2020	2021	2022	2023	2024	2025	Annual aver.	Note
R-32	Sum	37	37	37	419	510	557	609	315	
	SHEER	0	0	0	382	420	462	508	/	YoY 110%
	Daikin-FC	37	37	37	37	37	37	37		Based on interview to Daikin factory
	Daikin-SC	0	0	0	0	53	58	64		Substitute volume of R-22 in 2019-21from 2023
R-410a	Sum	1,048	2,156	2,574	2,950	3,245	3,569	3,926	2,781	
	SHEER	870	1,960	2,359	2,713	2,984	3,283	3,611	/	2019-2022 estimate of SHEER / 2023-2025 YoY110%
	Daikin-SC	178	196	215	237	261	287	315		2019 Based on interview to Daikin SC / 2020-2025 YoY 110%
R-134a	Sum	0	150	170	200	220	242	266	178	
	SHEER	0	150	170	200	220	242	266	/	2019 Based on interview to Daikin SC / 2020-2025 YoY 110%
	Daikin-SC	0	0	0	0	0	0	0		
R-22	Sum	53	1,458	1,744	2,087	2,295	2,525	2,777	1,848	
	SHEER	0	1,400	1,680	2,016	2,218	2,439	2,683	/	2019-2022 estimate of SHEER / 2023-2025 YoY110%
	Daikin-SC	53	58	64	71	78	85	94		2019 Based on interview to Daikin SC / 2020-2025 YoY 110%
Total		1,138	3,801	4,525	5,655	6,270	6,893	7,579	5,123	



↑ Location of Daikin Service Centers

Detail 2: JCM Registration

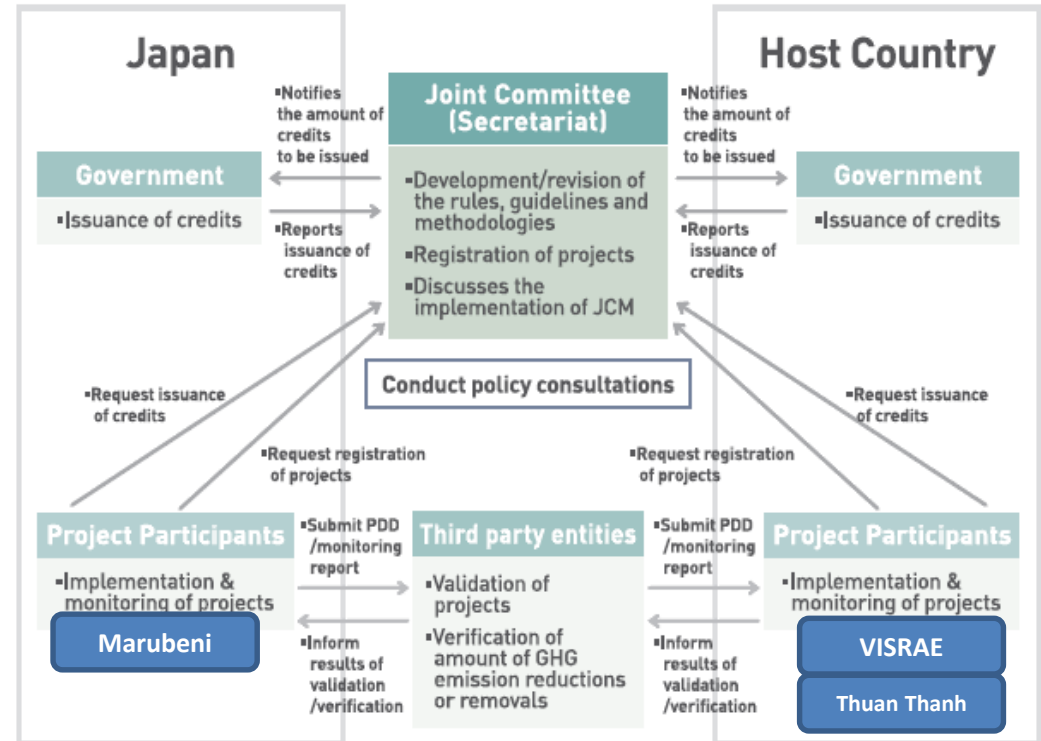
-Process-



Source) Global Environment Centre Foundation (GEC).
<http://gec.jp/jcm/about/>

Note: Local Stakeholder Consultation (LSC)
will held in 2020 as part of PDD
development

-Implementation Scheme-



Source) Progress of JCM Financing Programme and Feasibility Studies for JCM Projects by MOEJ (Nov 2015).
http://gec.jp/jcm/en/wp-content/themes/twentyten_jsps_part2/images/page/JCM_booklet_2015Nov.pdf

○ Detail 3: Policy Proposal & Capacity Building

Japan Visit

- ① Nov 2019: Mainly Thuan Thanh visit Japanese F-gas destruction facility and others.
- ② Jun 2020: Mainly SHEER visit Japanese experts for opinion exchange towards scheme development.

WG1

- Policy-maker (MONRE)
- Academic experts (SHEER)
- Some members from WG2 and/or WG3 (if needed)

Recovery & destruction scheme development, consideration of legislation

- Information sharing of existing scheme in other countries
- Consideration on recovery destruction scheme (flow, recoding & management method, cost allocation, monitoring method etc.)
- Consideration on incentive scheme (license etc.)

Results sharing

WG2

- SHEER/VISRAE
- Service operators (potential recovery servicers)
- Lecturers of Vocational Centers

Capacity building for F-gas recovery engineers

- Manual/handbook making
- Hold workshops for leakage inspection and recovery works (once for lecture in Dec 2019, once for practical training in 2020)
- Japan visit (see more in orange box)

WG3

- Commercial users

Awareness rising for F-gas recovery

- Workshop for F-gas management and proper treatment (once in 2020)

Explanatory notes

WG

- Target

Objective

- Contents

More detail will be provided later.

Project Schedule

Contents		FY2019								FY2020											
		8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1. Recovery & Destruction Activity	1) Recovery activity																				
	2) Consideration of financial plan / Decision making for the investment																				
	3) License acquisition / Procurement Planning																				
	4) Facility introduction (Produstion to install)																				
	5) Traial run / Operation training																				
	6) Destruction activity																				
2. JCM Registration	1) Methodology development / Consideration of monitoring plan																				
	2) Making PDD for project registration																				
	3) Implementation of monitoring																				
3. Capacity Building Activity	1) WG1: Information sharing																				
	2) WG1: Scheme consideration for Vietnam																				
	3) WG2: Manual making for recovery																				
	4) WG2: Workshop for recovey activity																				
	5) WG2: Japan visit																				
	6) WG3: Workshop for awareness rising																				

FY2021 ~

Expand F-gas recovery and destruction project in
Ho Chi Minh and Da Nang



THANK YOU !

FOR ANY QUESTIONS OR COMMENT, PLEASE CONTACT
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