



Energy cost saving opportunity by onsite energy service

November 2018

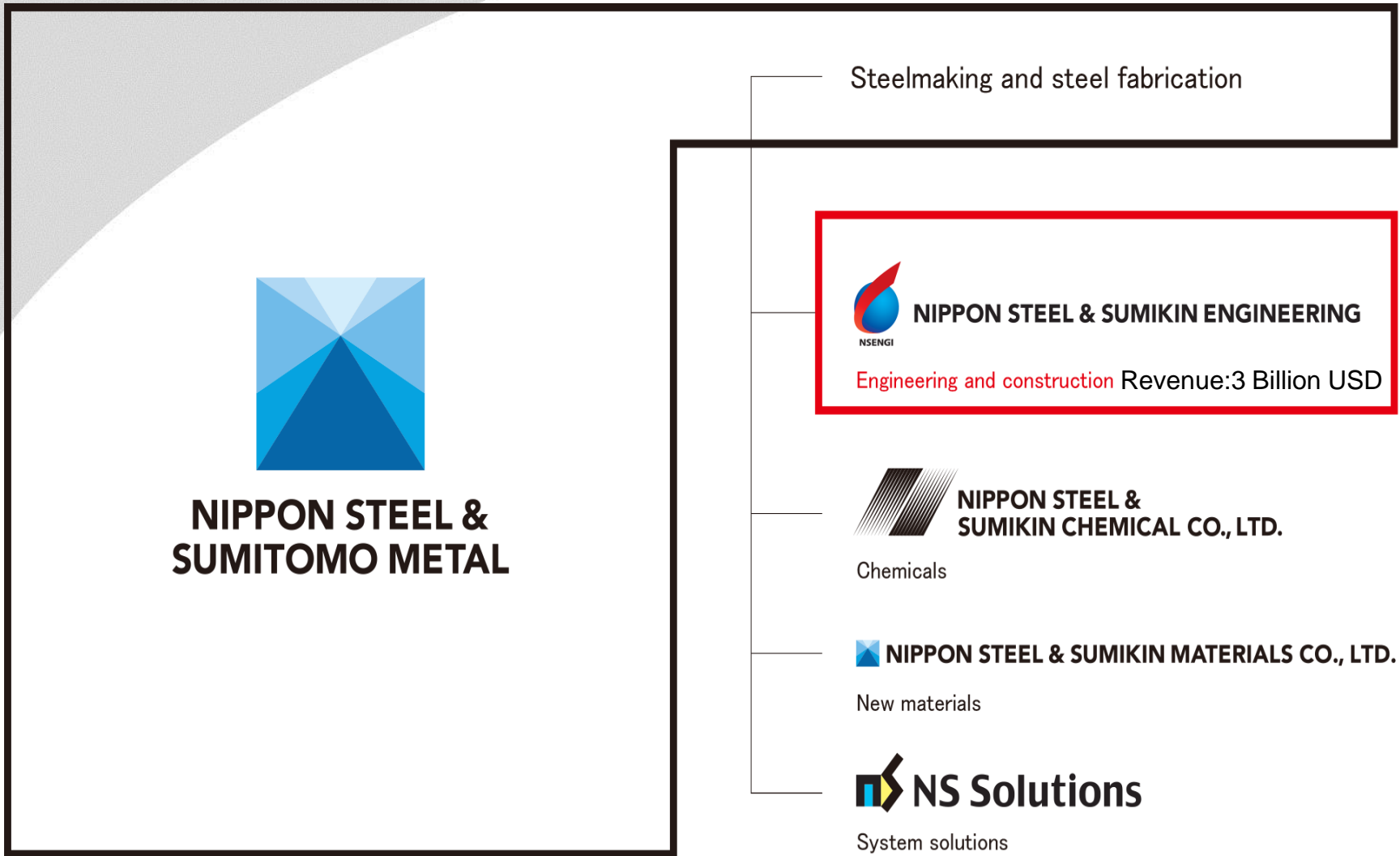
Nippon Steel & Sumikin Engineering Co., Ltd. (NSENGI)

- **Company overview**
- Onsite energy service by CHP(Combined Heat and Power)
- Next Step

NSENGI is the core subsidiary of Nippon Steel & Sumitomo Metal, engaged in EPC and O&M businesses

Confidential

Group Total Revenue: USD 51Bil.(2017Fy)



Steelmaking and steel fabrication



NIPPON STEEL & SUMIKIN ENGINEERING

Engineering and construction Revenue: 3 Billion USD



**NIPPON STEEL &
SUMIKIN CHEMICAL CO., LTD.**

Chemicals



NIPPON STEEL & SUMIKIN MATERIALS CO., LTD.

New materials



NS Solutions

System solutions

NSENGI has 6 business domains and is strongly expanding energy solutions business

Confidential

Steel Plants

- Ironmaking
- Direct reduction plants
- Steelmaking
- Continuous casting/Processing line
- Environmental and energy saving



Waste to Energy

- Waste to energy plants
- Resource recycling
- Soil/Groundwater remediation



Energy Solutions

- On-site energy service business
- Power retailing business
- Geothermal plants
- Energy plants
- Hydrogen Refueling Stations(HRS)



Marine Engineering and Construction

- Oil / Natural gas development facilities
- Marine infrastructure development



Building Construction and Steel Structures

- Comprehensive building construction
- Standardized building
- High-tech steel structures
- Pre-engineered products



Pipelines

- On-land pipelines
- Water works



We have half-century history in Indonesia and contributed to Indonesia industry development

Confidential



General (&others)

■ 1972 Nippon Steel Construction Indonesia (**NISCONI**) established

- For Oil & Gas development project in Indonesia

■ **NS-BATAM** established 1994

- For fabrication yard and shore base of our two Derrick and Lay barge

Jakarta Representative Office opened 2013 ■

Marine Engineering & Construction

■ 1968 completion for 1st Pipeline project of PT Pertamina

■ 1974 Ballast Water Treatment Project

■ 1974 Balongan Oil Strage Project

■ 1981 Rantau LPG Project

■ 1988 Bongtan LNG Piping Project

South Sumatra • West Jawa gas pipeline project 2005 ■

TOTAL Sisinubi Phase-1 / EPSC3 2007 ■

CONOCO Phillips North Belut project 2009 ■

TOTAL South Mahakam 2012 ■



Submarine pipeline project



Offshore platform

Steel Plant



❖ PT Krakatau- NSSMC (KNSS)

1988 PT FUMIRA / CGL*

■ PT Latinusa 2011 ETL** ■

PT Krakatau - NSSMC / CGL* 2014 ■

PT Krakatau – OSAKA STEEL 2015 ■

3 strip-mill projects under construction 2017- ■

*Continuous Hot-Dip Galvanizing Line, **Electronic tinning line

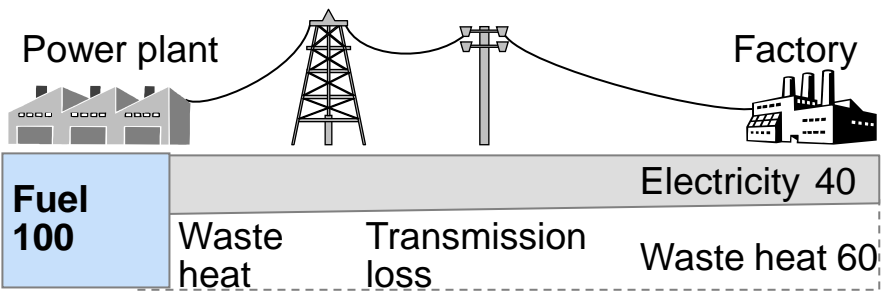
- Company overview
- **Onsite energy service by CHP(Combined Heat and Power)**
- Next Step

CHP achieves highly efficient energy use by the maximum use of waste heat generated in power generation process.

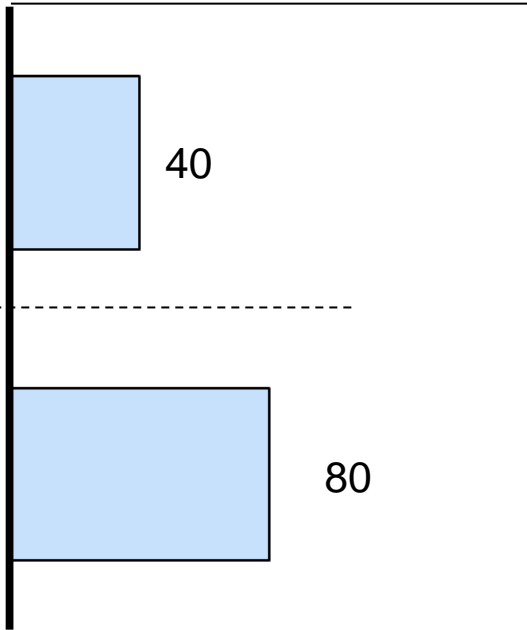
Concept

Energy balance

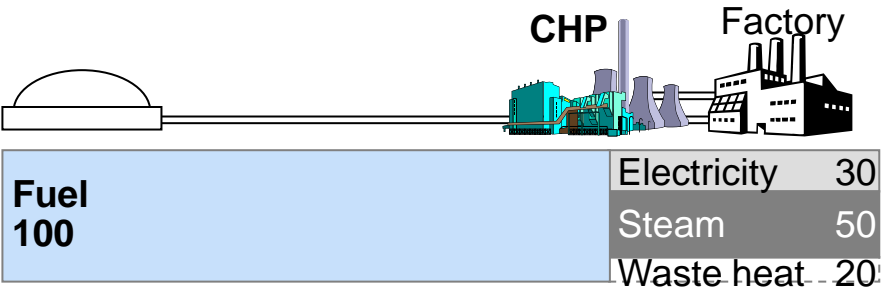
**Conventional
power
generation
and
transmission**



Overall energy efficiency %



CHP

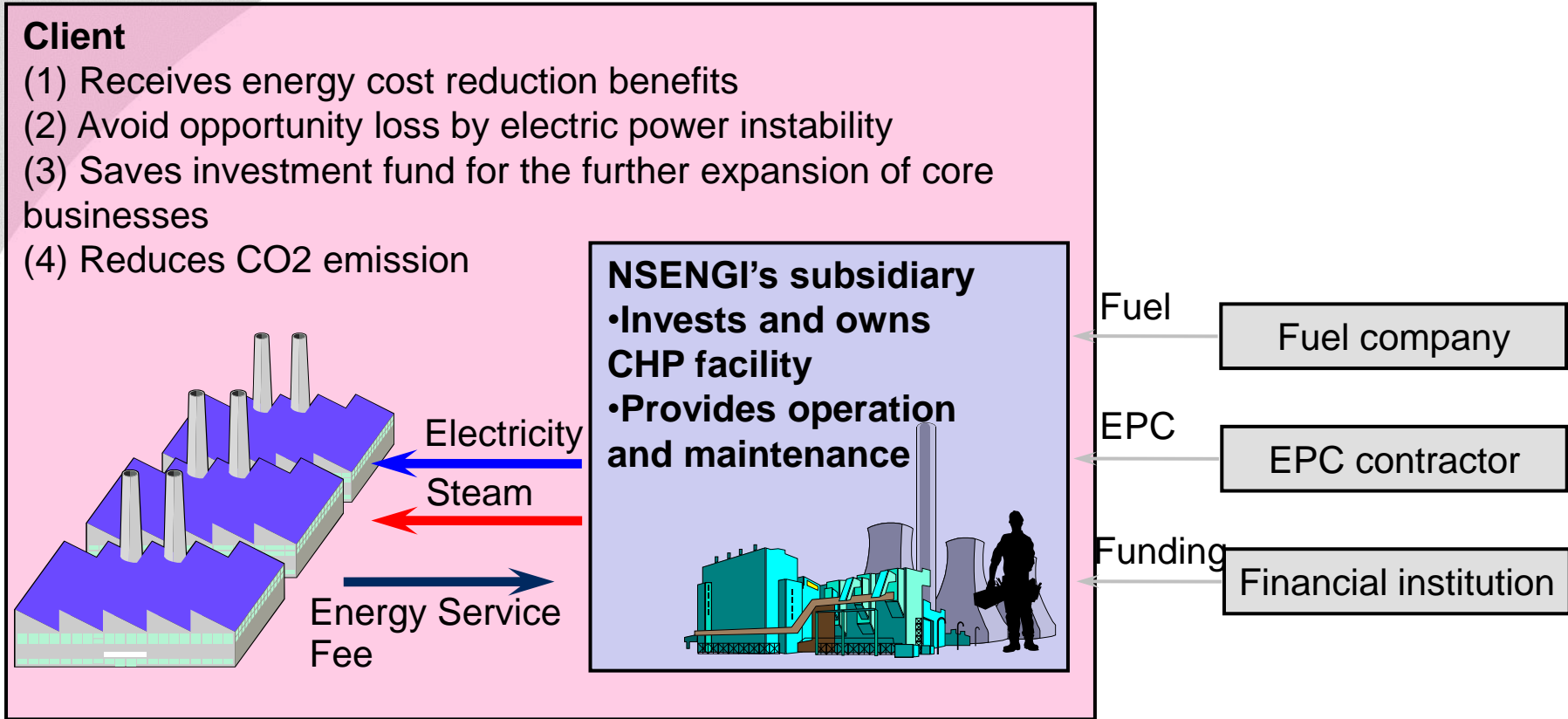


- Cost saving through primary energy saving
- CO2 emission reduction

NSENGI's on-site energy service

Clients enjoy energy cost reduction benefits with no capital expenditure, provided with energy by NSENGI's subsidiary

Overview of onsite energy providing service



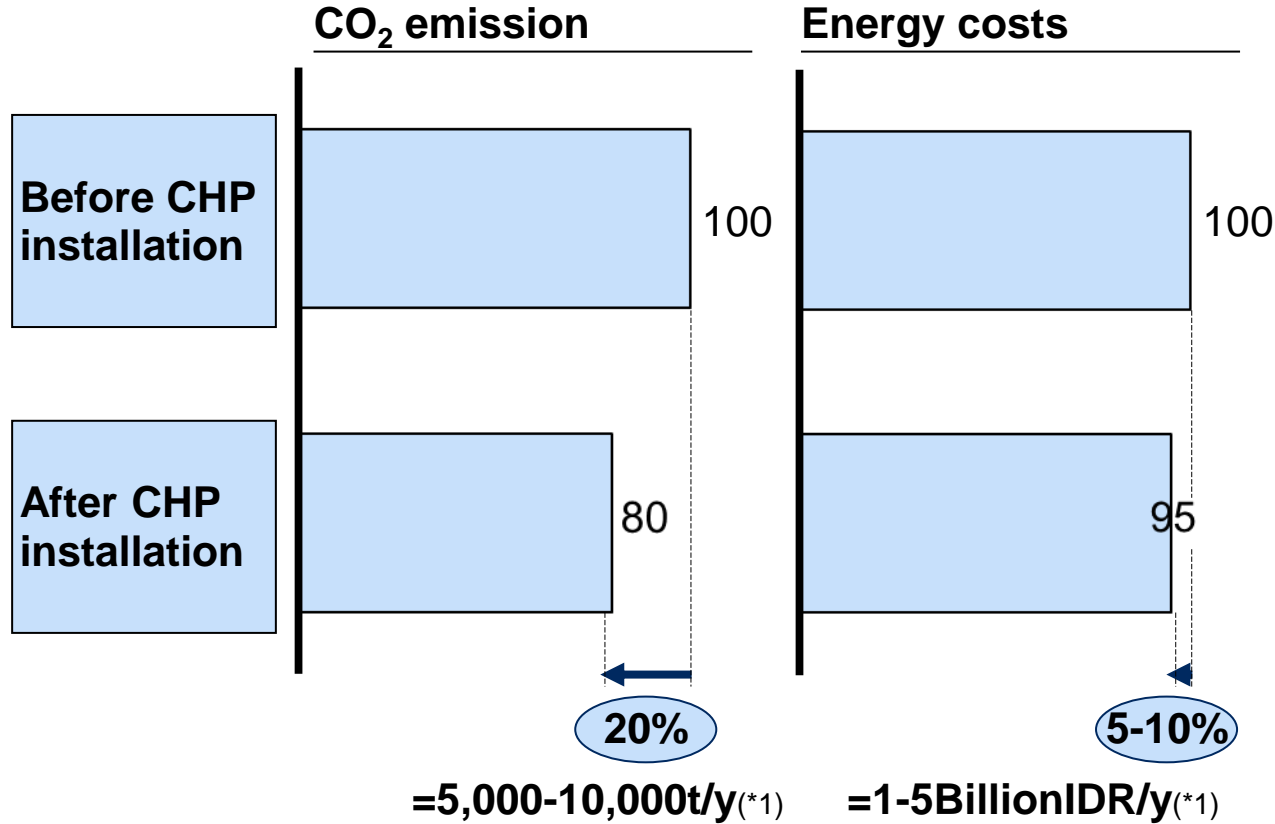
NSENGI successfully achieves reduction in CO₂ emission as well as energy costs* by installing cogeneration system

Confidential

Potential Client

- Client whose steam demand is over 15 t/h
- Client whose steam demand is over 5 t/h and hot water demand is over 2,000 kwh.

CASE EXAMPLE



(*1) Numbers are subject to further feasibility study based on the client actual energy usage

NSENGI has performed many power plant projects in Japan and carried out 5 energy service projects.

	Client	Place	Capacity	COD
1	Power plant	Aichi	147MW BTG	Feb 2000
2	Power plant	Fukuoka	22MW GE	Nov 2001
3	Chemical plant	Shizuoka	7MW GT	Sep 2002
4	Office tower	Tokyo	40MW GT	Apr 2003
5	Chemical plant	Shizuoka	17MW GE	Dec 2004
6	Power plant	Niigata	110MW BTG	Jul 2005
7	Power plant	Miyazaki	50MW BTG	Jun 2006
8	Chemical plant	Ibaragi	11MW GE	Jan 2010
9	Power plant	Hiroshima	11MW GE	3Q 2018
10	Power plant	Miyazaki	50MW BTG	1Q 2019
11	☆Fuji Film	Kumamoto	28MW GT	Apr 2006
12	☆Ajinomoto	Kanagawa	30MW GE	Mar 2007
13	☆J Oil Mills	Chiba	7MW GT	Feb 2016
14	☆J Oil Mills	Shizuoka	7MW GT	Feb 2017
15	☆Kojin Life Science	Oita	11MW GT	1Q 2019

☆: Energy service projects.

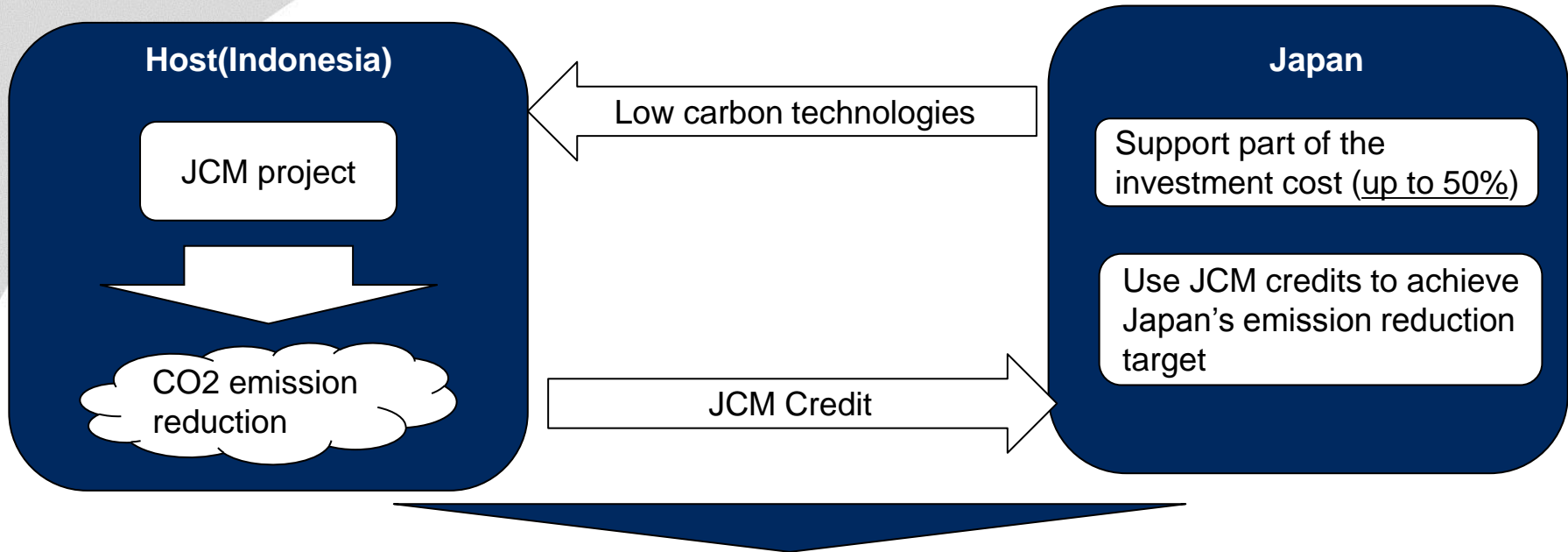
NSENGI has carried out on-site energy service mainly for automobile, chemical and rubber industries in Thailand

Client	Facility	Commercial Operation Date
Honda Automobile (Thailand)	Hot water boiler & turbo chiller	July 2015
Luckytex (Thailand)	6MW Gas turbine CHP	December 2016
Yokohama Tire Manufacturing (Thailand)	6MW Gas turbine CHP	May 2017
Honda Automobile (Thailand)	7MW Gas engine CHP	November 2017
Thai Honda Manufacturing	7MW Gas engine CHP	April 2018

Japan government support for investment cost through Joint Crediting Mechanism

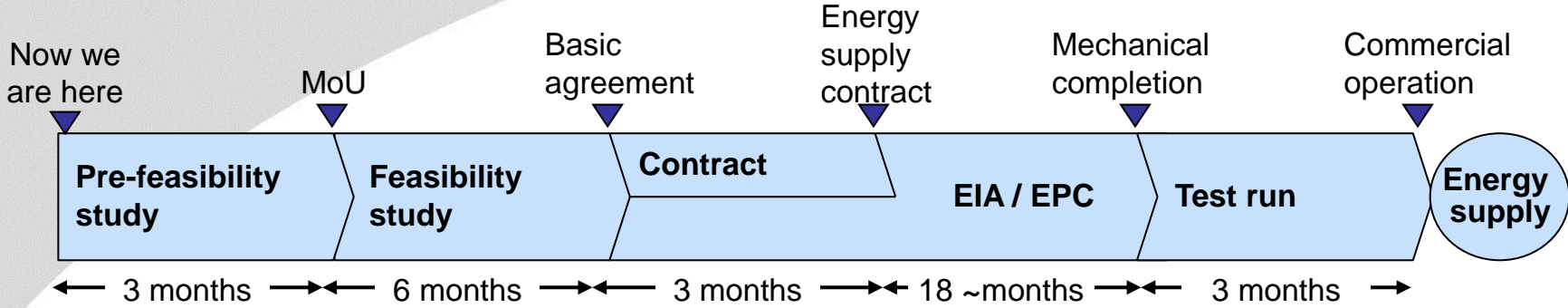
Japan Government's support for part of the investment cost through Joint Crediting Mechanism provide further cost reduction benefit to client

Joint Crediting Mechanism(JCM)



- NSENGI's Thailand project was awarded as the 1st CHP based JCM model project in Thailand in 2015 (CO2 emission reduction : 7,414t/y)
- NSENGI has a know-how of application and acquirement of JCM subsidy

- Company overview
- Onsite energy service by CHP(Combined Heat and Power)
- **Next Step**



Activities

- Economic evaluation based on conceptual design to understand order of magnitude of cost reduction benefit
- Agree on MOU for FS
- Develop basic plan/design
- Reach a basic agreement of energy supply contract draft including
 - Price formula
 - Risk/responsibility sharing
- Document energy supply contract involving legal departments
- Submit official applications for gas supply
- Obtain approvals from authorities
- Build power plant facilities
- Agree on contracts with 3rd parties (fuel company, financial institutions)
- Establish stable energy supply

Required data

- “Energy Usage Survey”
- Single-line diagram
- Steam piping diagram
- Piping specification
- Boring log
- Building plot etc.

Thank you

Contact: Shuzo Chiba
Indonesia Branch Manager
chiba.shuuzoh.3gr@eng.nssmc.com