

***Energy and Environment***

December 2010

**Chiyoda Corporation**

# *Energy and Environment*

*Salmon making the journey up the river that runs through the LNG plant site.*



Photo: Courtesy of Sakhalin Energy Investment Company

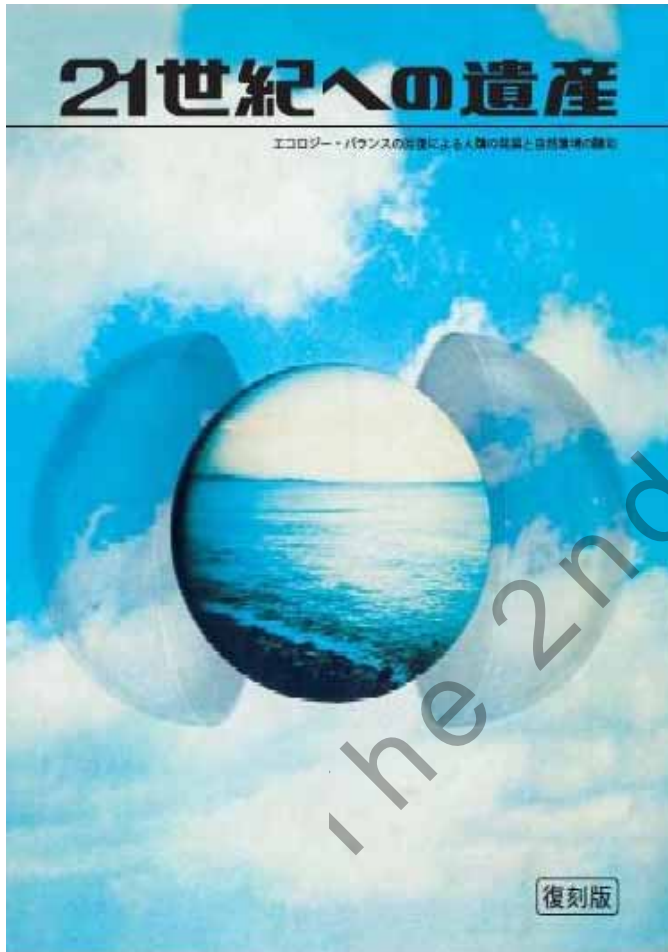
# Sakhalin LNG

The first LNG Plant in Russia completed by Chiyoda  
in 2008 (4.8 MMTPA x 2 trains)



Photo: Courtesy of Sakhalin Energy Investment Company

# A Legacy for the 21st Century



***In 1972, Chiyoda issued a booklet entitled “Legacy for the 21st Century” that described the need for harmony between the advancement of humankind and conservation of the natural environment.***

***This spirit is passed on to the new generation of Chiyoda people so that our DNA remains the nucleus of all our technologies.***

# Corporate Philosophy

***Enhance our business in aiming for harmony between energy and the environment and contribute to the sustainable development of a society as an integrated engineering company through the use of our collective wisdom and painstakingly developed technology.***



***Where “harmony between energy and the environment” is required, engineering company’s capability of system integration and project management skills are required.***

Who is



**CHIYODA** CORPORATION ?

Japan's Leading Integrated Engineering & Project Company

- ▼ Over **60** years global engineering business
- ▼ Over **40** years experience in Arab Region
- ▼ Over **6,000** staffs (Global Basis)

*Paid up Capital : ¥ 43.4 Billion (equivalent to US\$ 515 Mil.)*  
*Revenues for FY2009: ¥ 313.0 Billion (equivalent to US\$ 3,714 Mil.)*  
*New Orders for FY 2009: ¥ 429.4 Billion (equivalent to US\$ 5,096 Mil.)*  
*As of March 2010*

# Business Fields

LNG  
 - liquefaction plant,  
 - receiving terminals  
 Synthesis gas  
 Gas Upstream



Solar Panel  
 Lithium-ion Battery  
 Polycrystalline Silicon



Gas Value Chain

Green Energy

Environmental Protection

Upstream



Flue gas desulfurization  
 Acid gas/CO<sub>2</sub> capture and storage  
 Energy conservation



Heavy oil upgrading  
 - grass roots  
 - revamping

Refineries

Metals & Mining

Petrochemicals & Chemicals

General Industry

Pharmaceuticals



Metallurgical Refining and Smelting



Methanol  
 Fertilizer  
 Olefins  
 Aromatics



Electronic materials  
 Food processing



# Development of CHIYODA's Business Field

## 1. Renewable Energy, Environmental Protection & Carbon Management

Solar Energy

Lithium-ion battery

Carbon Capture and Sequestration

Water & wastewater Management

Flue gas desulfurization process technology



## 2. New Materials and Metals & Mining

Polycrystalline Silicon

Non-ferrous Metals

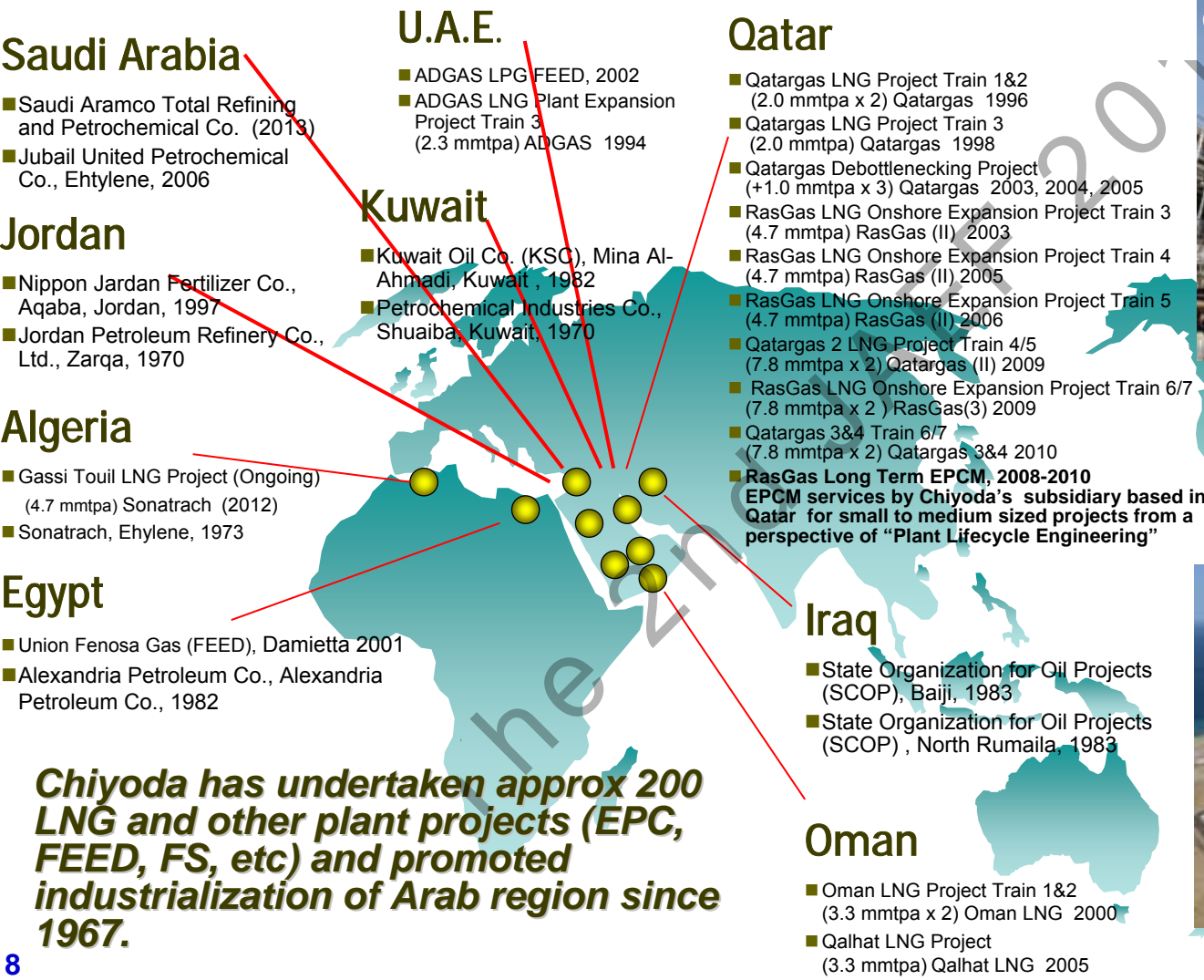


## 3. Pharmaceuticals





# CHIYODA's activities in Arab Region over 40 years (approx 200 projects)



**Chiyoda has undertaken approx 200 LNG and other plant projects (EPC, FEED, FS, etc) and promoted industrialization of Arab region since 1967.**

# CHIYODA: Various LNG Experiences

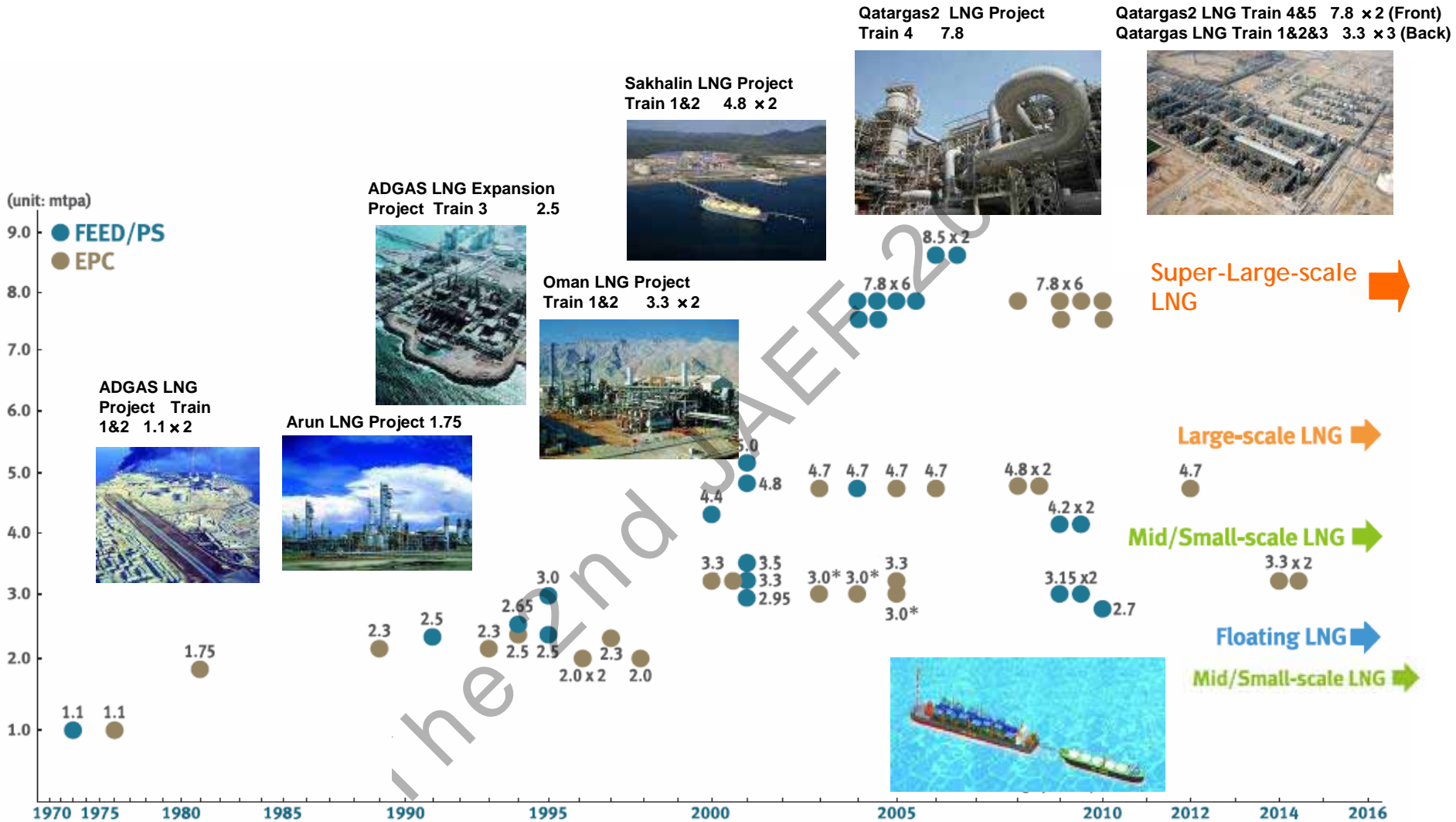


Photo: Courtesy of Qatargas Operating Company Limited, Sakhalin Energy Investment Company, Oman LNG.



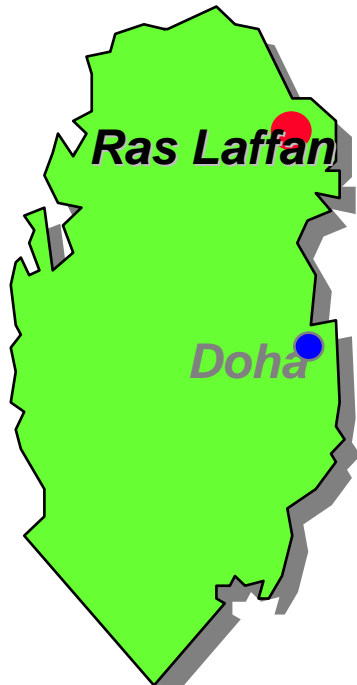
Courtesy of Qatargas

## LNG plants in Qatar

**Qatar's capacity : 77 MMTPA**

**Global capacity : approx. 200 MMTPA**

**Chiyoda took part in all LNG projects implemented in Qatar.**



**Ras Laffan**

**Doha**

Qatargas 2 LNG Project Train 4/5  
(7.8 mmtpa x 2) Qatargas (II) 2009



Courtesy of Qatargas Operating Limited

# *Chiyoda's Plant Lifecycle Engineering (PLE) based on local partnership*



**Chiyoda Almana Engineering LLC (“CAEL”)’s business field:**

**Small to medium-sized Projects on a Long Term EPCm basis, such as Revamp, Rehabilitation, Repair and Technical Services.**

# ***Contribution in Human Resource Development since '70s***

***Thousands of University Students and Engineers from Arab Region were trained at CHIYODA.***



# Energy and Environment in Harmony



***Aiming for “Energy and Environment in Harmony”,  
CHIYODA participates in environment related projects.***



# Solar Energy

## A World's largest Solar Panel Plant with a Mega Solar Power Plant

Kunitomi Solar Panel manufacturing Plant (No.3 Plant) 

Mega Solar Capacity:2,000kW



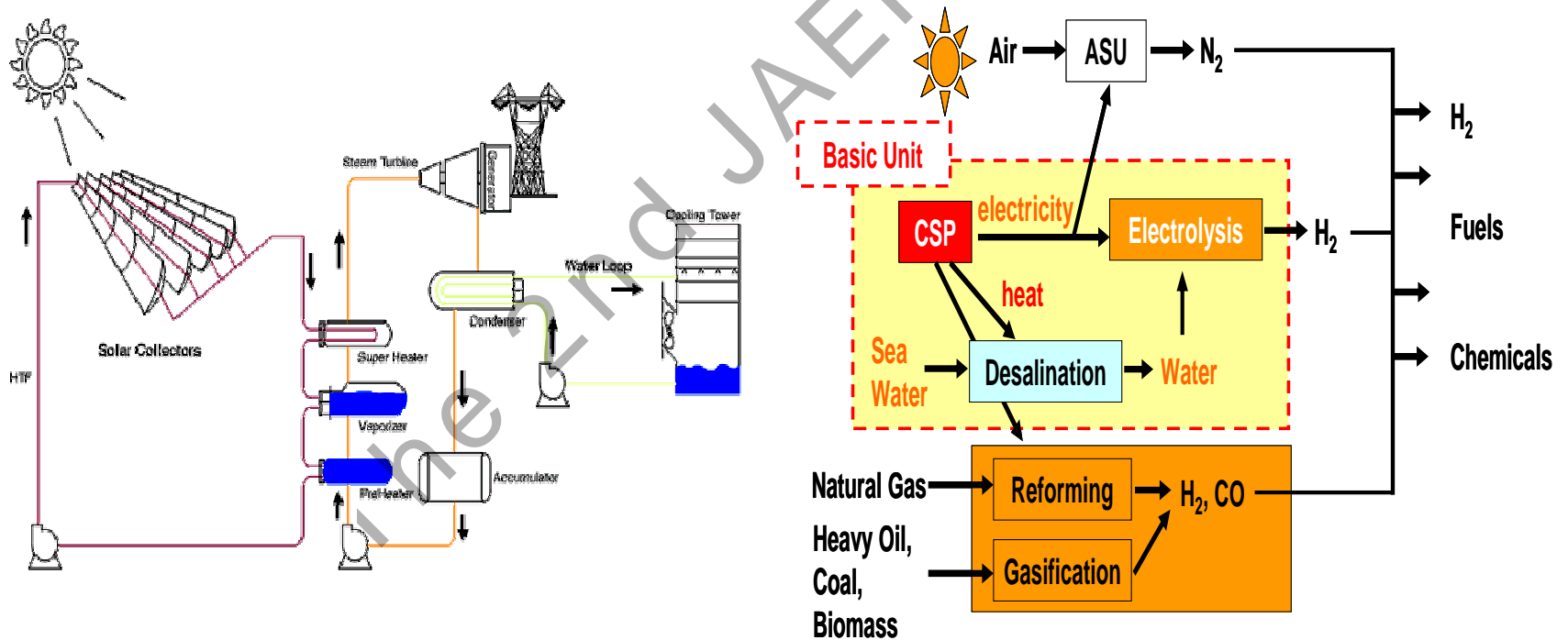
**Profile**  
 Location: Miyazaki, Japan  
 Capacity: 900 MW/yr  
 (World's largest plant)  
 This plant will be operated in the first half of 2011.



Courtesy of Solar Frontier

# Concentrating Solar Power (CSP)

*Chiyoda is developing a multipurpose CSP system by utilizing high thermal energy not only for power generation but for other usage.*



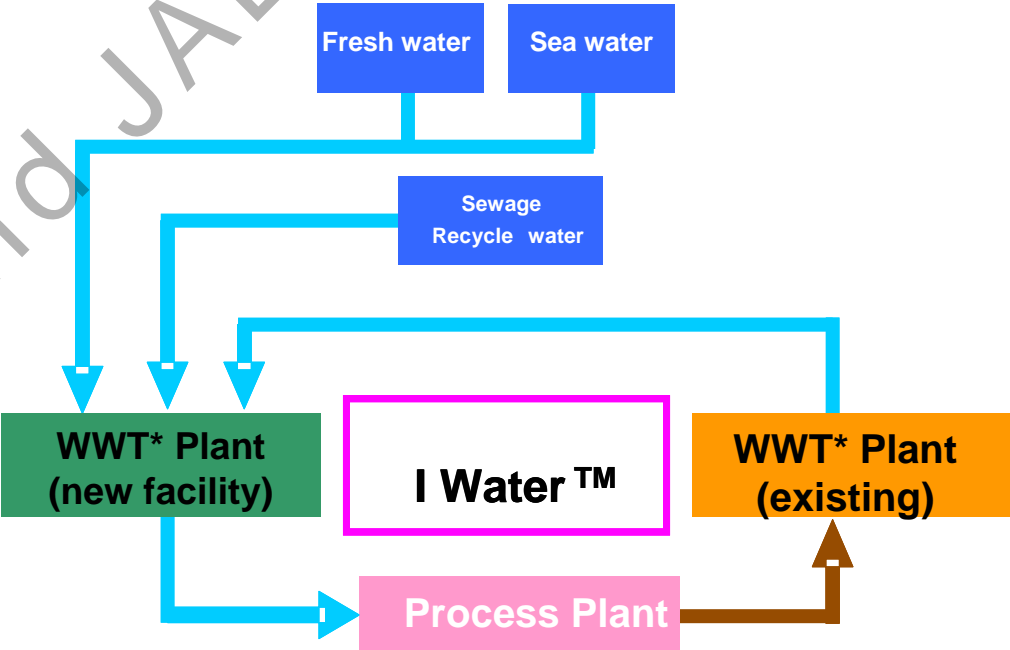




# Water Management

## Chiyoda's Contribution in Valuable Water management

*Chiyoda provides a next-generation water recycling system as a solution for effective utilization of valuable water, and offers a system that recycles industrial wastewater into I Water™ (industrial Water) by means of MBR (Membrane Bio Reactor) and RO system (Reverse Osmosis Membrane).*



\* WWT: Waste Water Treatment

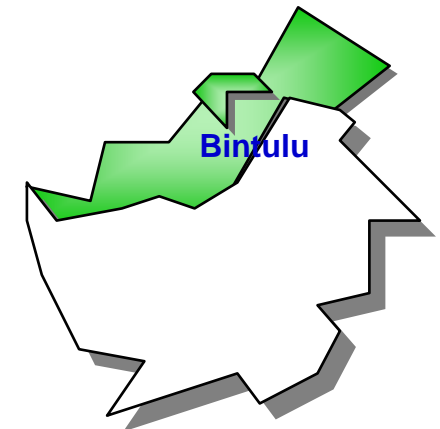
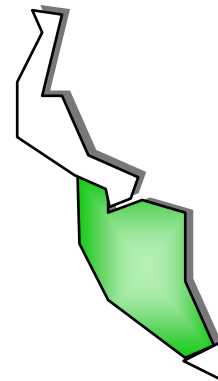
# Polycrystalline Silicon Plant, Malaysia

## Summary of Project

1. Client : Tokuyama Corporation
2. Plant : Polycrystalline Silicon Plant
3. Capacity : 6,000 tons per year
4. Site : Bintulu, Sarawak, Malaysia
5. Completion : 2013



Mr. Kogo, President of Tokuyama (left) and Mr. Kubota, President of Chiyoda (right) September, 2010.





**Chiyoda, your partner for success**

شُكْرًا جَزِيلًا

**Thank you very much.**

Chiyoda AEF 2010