

1st meeting of the Advisory Committee
on the IASS program

**Long-distance energy transport through
superconducting electric line_ *Asian Grid+***

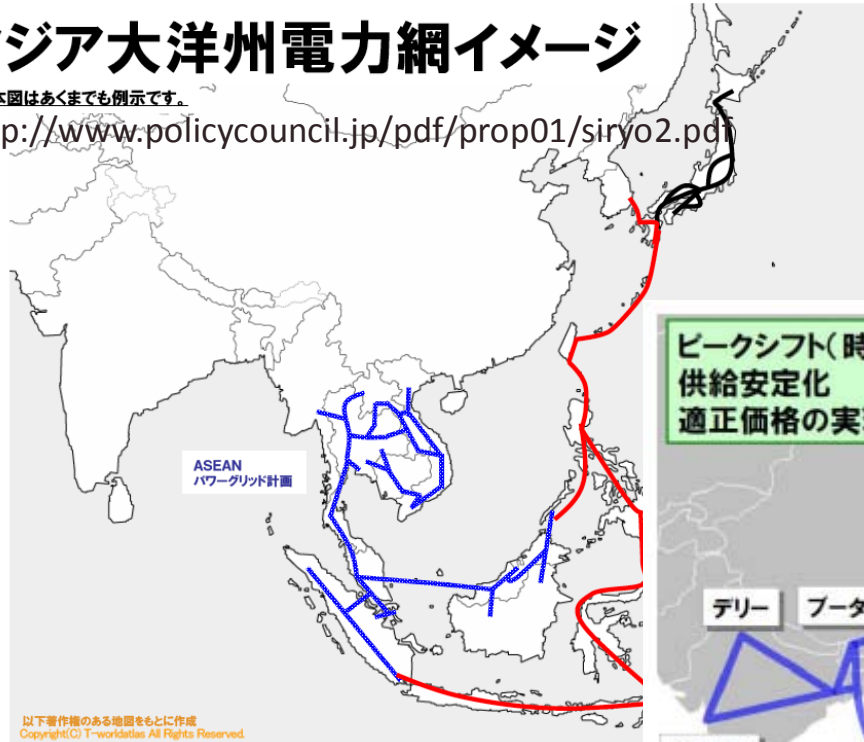
Satarou Yamaguchi
Chubu University, Japan

Some Proposals for Asian International Power Grid

アジア大洋州電力網イメージ

※本図はあくまでも例示です。

<http://www.policycouncil.jp/pdf/prop01/siryo2.pdf>



Japan Policy Council

Several Parties proposed in Japan

Japan Renewable Energy Foundation



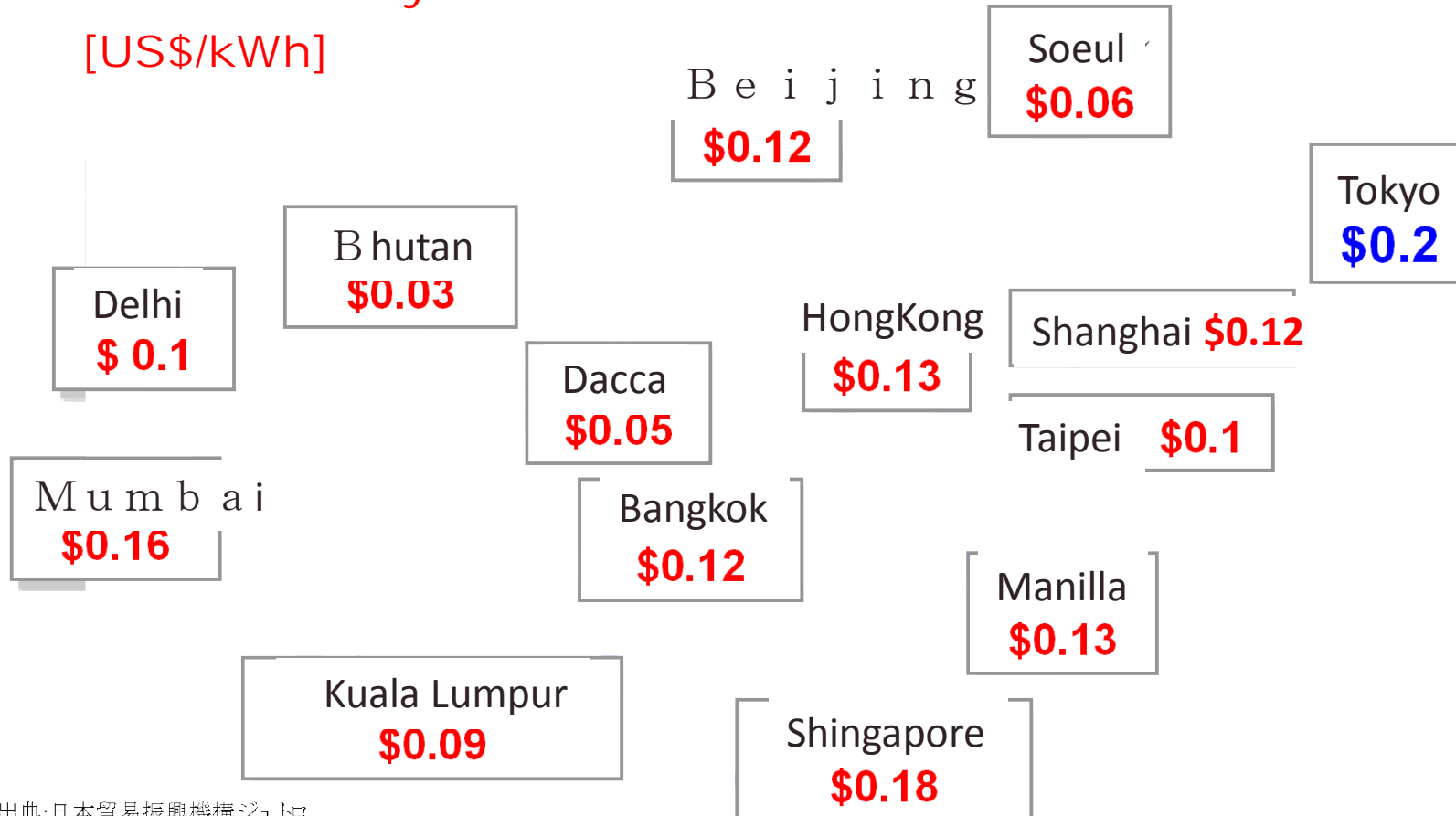
Subjects,
Who will make the Grid? Who will operate it? What is the rule to operate?
How to settle the price? Who will bring the money to construct?many subjects!

Present price of Electricity & a proposed Asian International Grid by telecommunication company in Japan

IASS meeint@Potsdam
@Nov. 29, 2012

Japan Renewable Energy Foundation

Price of Electricity
[US\$/kWh]

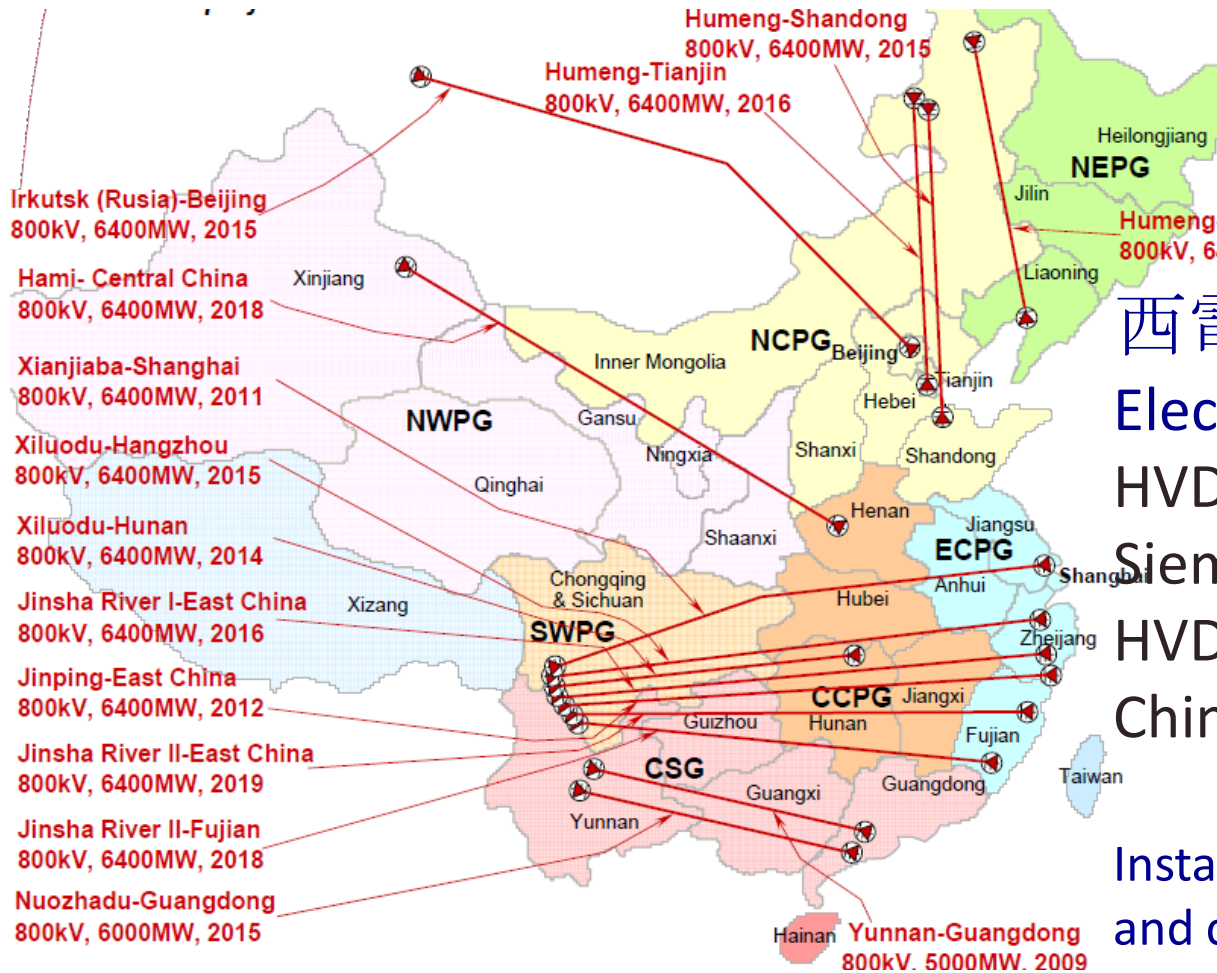


※出典:日本貿易振興機構ジェトロ
各国の業務/産業用電気料金

- 1) Import-Export will be a good business,
- 2) Exchange will improve the electric system in individual country
- 3) Save to construct power station,
- 4) Maximize the installation of Renewable Energy

Long Distance Transmission in China

HVDC is a common transmission line in China



西電東送

Electricity from West to East

HVDC > 600kV

Siemens, ABB++

HVDC < 600kV

Chinese company

Installed before Beijing Olympic,
and continued to install until 2020.

Total 64GW

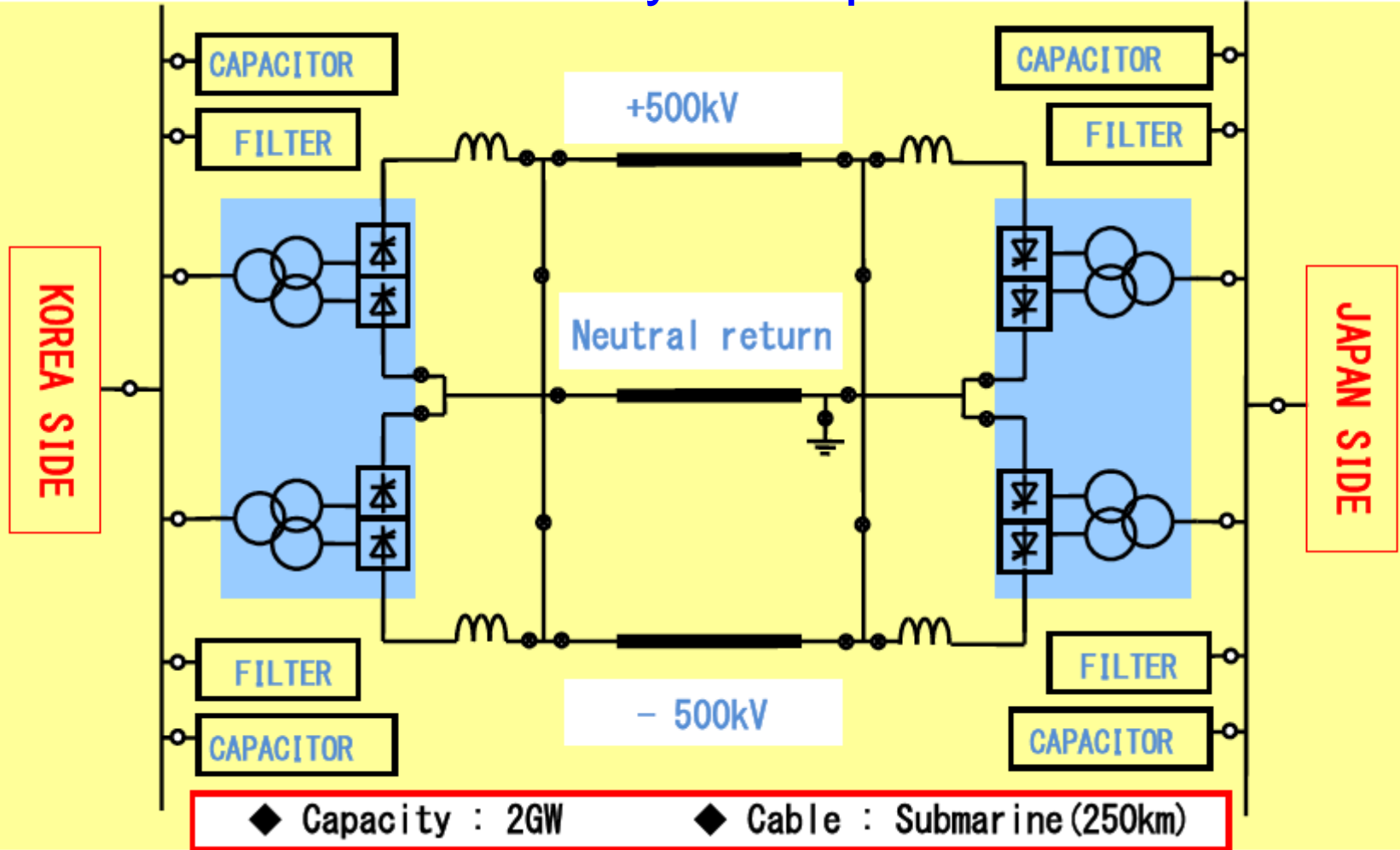
<800kV HVDC projects planned in China 2009~2019>

Japan-Korea DC Power Line

on 2012/11/01 @Embassy of Korea, Tokyo

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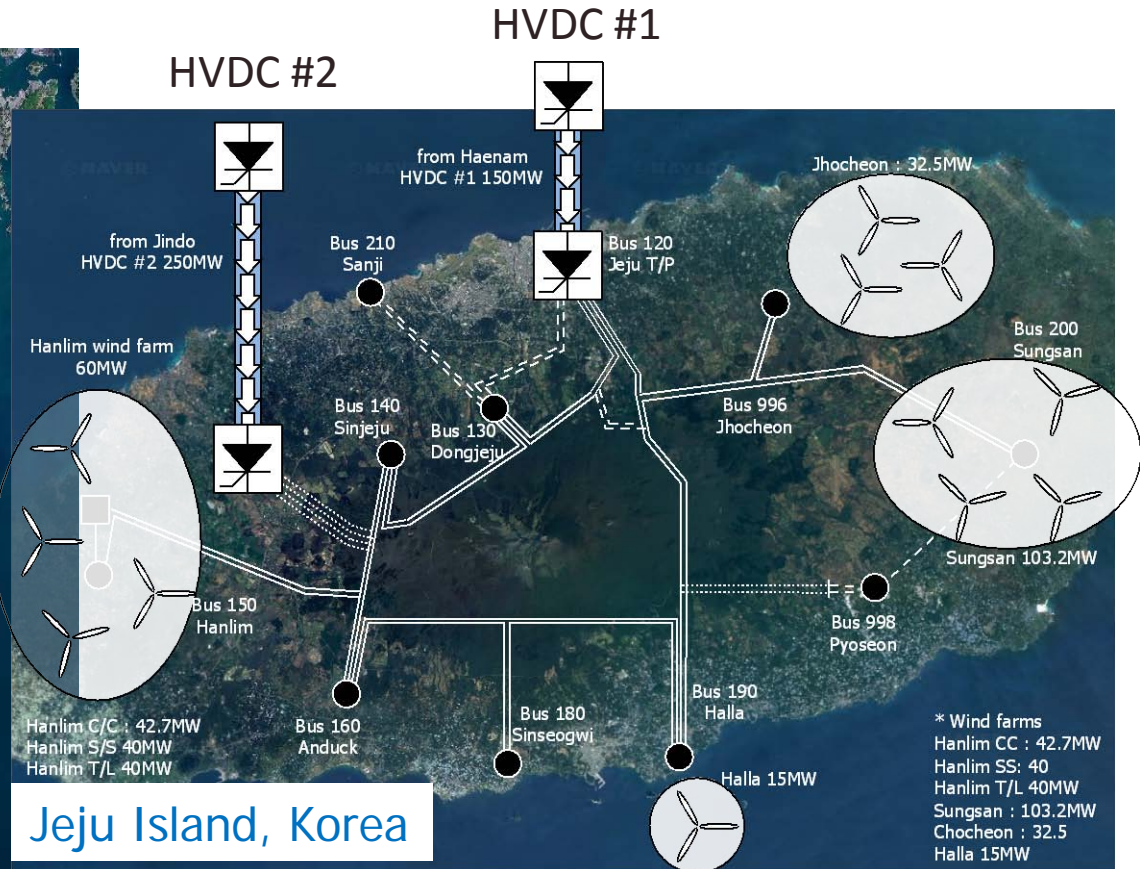
LS Electric & LS Cable Very Cheap ~ 350MUS\$!



Which parts of Japan and Korea will be connected? Who will make it? Who will operate?
How to settle the price of electricity? What is the rule of operation?

Long DC transmission line in Korea

HVDC (submarine cable)



- 1) Japan and Korea has the DC Power Transmission line to connect the island.
- 2) There are many merits to connect between Japan and Korea in technology, but it might depend the governments.

HVDC #1	180kV	300MW	100km
HVDC #2	250kV	400MW	120km
Hanlim HVDC	80kV	60MW	5km

Project DESERTEC by Germany

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Subject

How to get the agreement from Maglev countries.
How to help the development project of Maglev countries.

Transmission will start in 2020!
Chinese DC power grid will be completed in 2020.

If we connect western parts of China and Iran,
We will be able to transmit the power from Beijing to London?



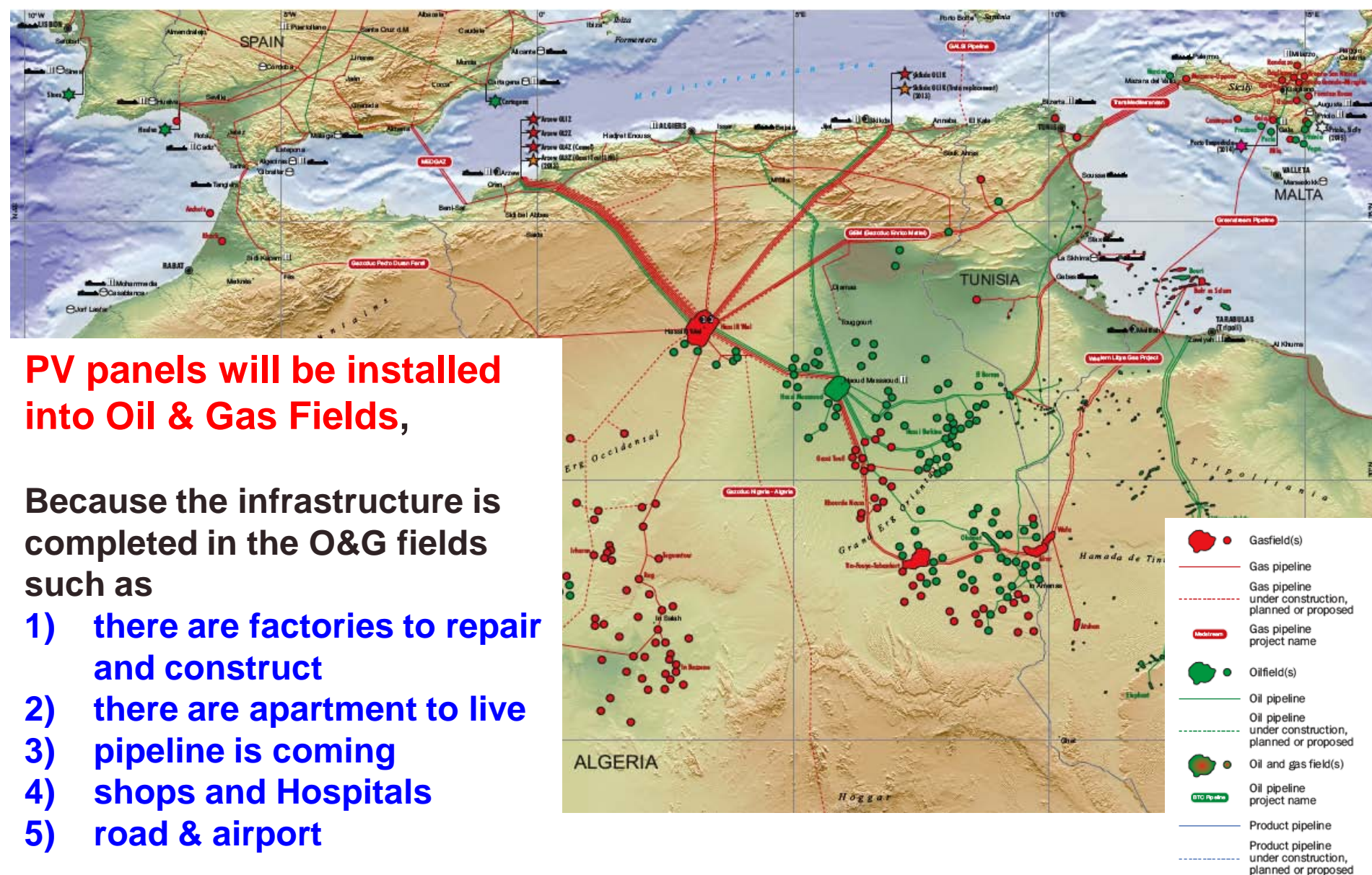
**Germany will abandon Nuclear Power Stations until 2022.
Wind Power in North Sea, CSP/Pv in Sahara Desert,
and ultra-long transmission line**



Where we will install PV in Sahara Desert?

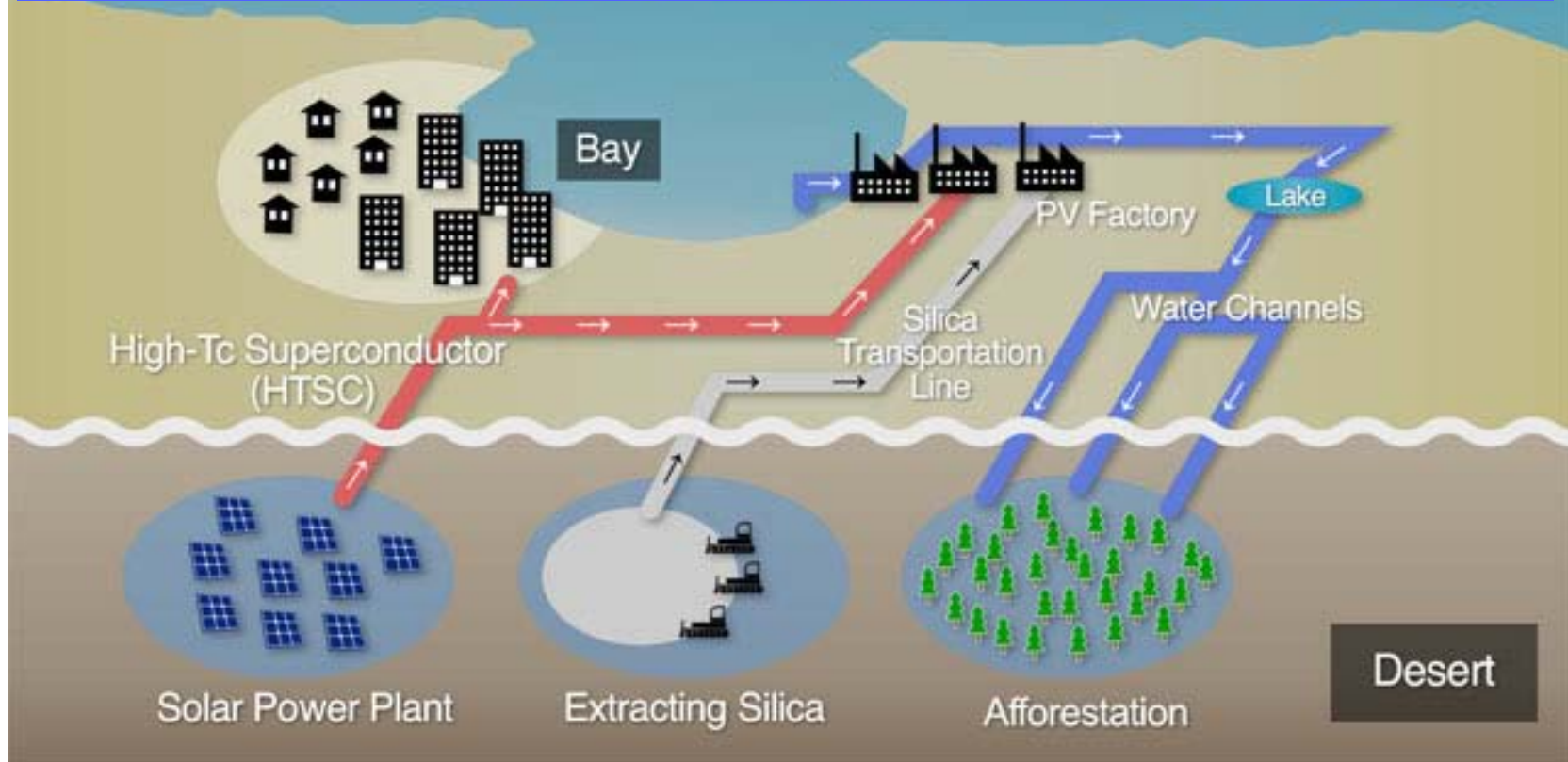
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World Energy Atlas, 6th Edition



Sahara Solar Breeder Project as Japanese project

We must find a realistic way to realize the Vision



- 1) Prof. Koinuma proposed SSB concept in beginning of the 21st century, and GENESIS project was proposed by Dr. Kuwano in 1989 originally.
- 2) Solar Panel grade Silicone will be obtained from the sand in the desert.
- 3) Electric power will be transmitted by DC Superconducting Power Transmission.
- 4) Electric Power from PV will be used in the Sahara countries and exported to Euro partially.



Why pipelines were built?

They were built for export the gas and oil.



The gas and (oil) are used to generate electricity in Europe,



If we transmit electricity from north Africa, is it a better business instead of the export of Oil and Gas and for Maglev countries?



If it is the export of electricity is a good business (maybe so),
People want to invest for the the construction, and we don't need
to pay attention to keep the budget so much.

Fundamental problem is why we use Superconductivity!