Perspectives of Natural Gas demand and supply balance in Korea

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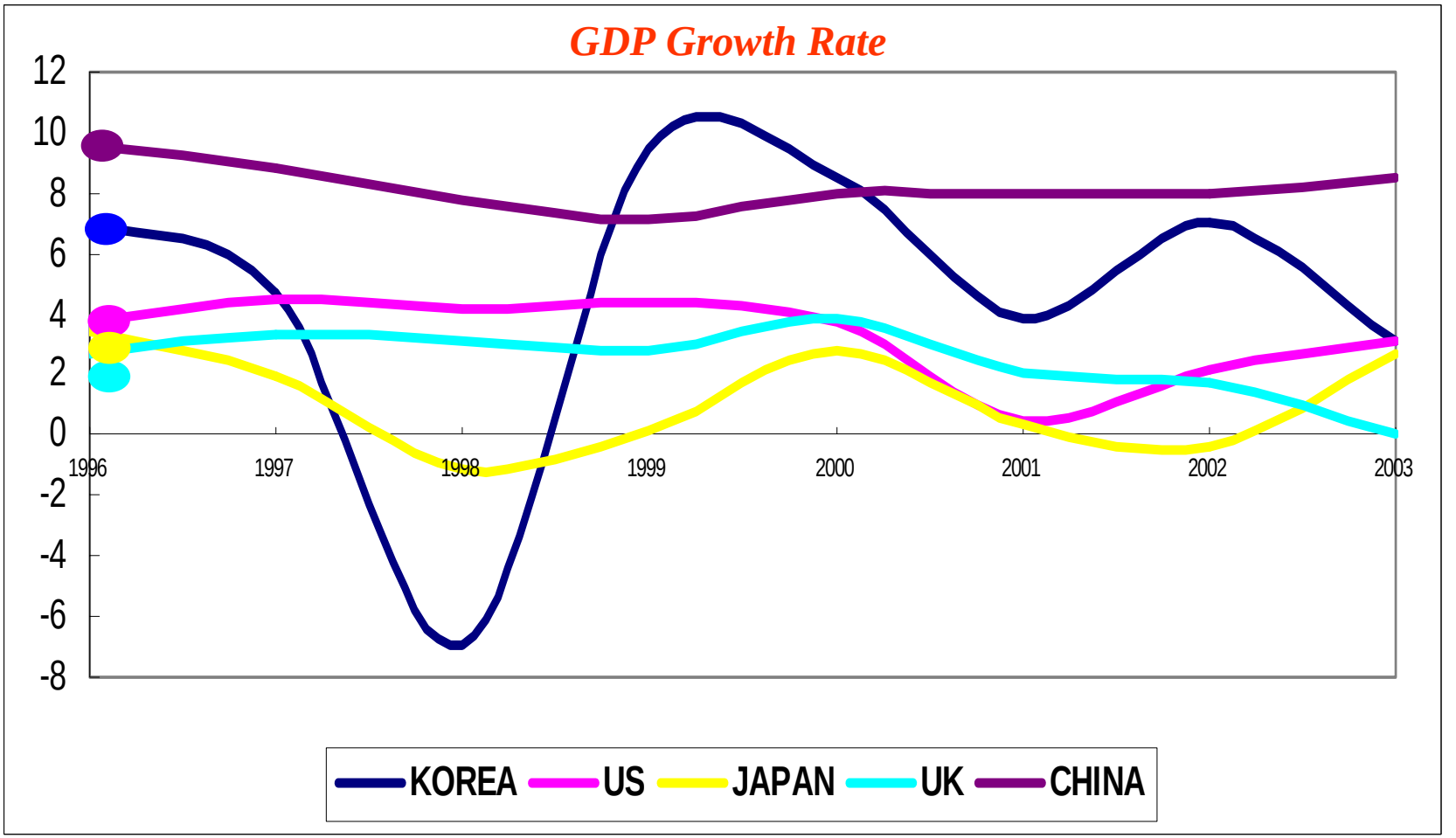
1. Perspectives of Economic Development in Korea

1.1 Macroeconomic Trends



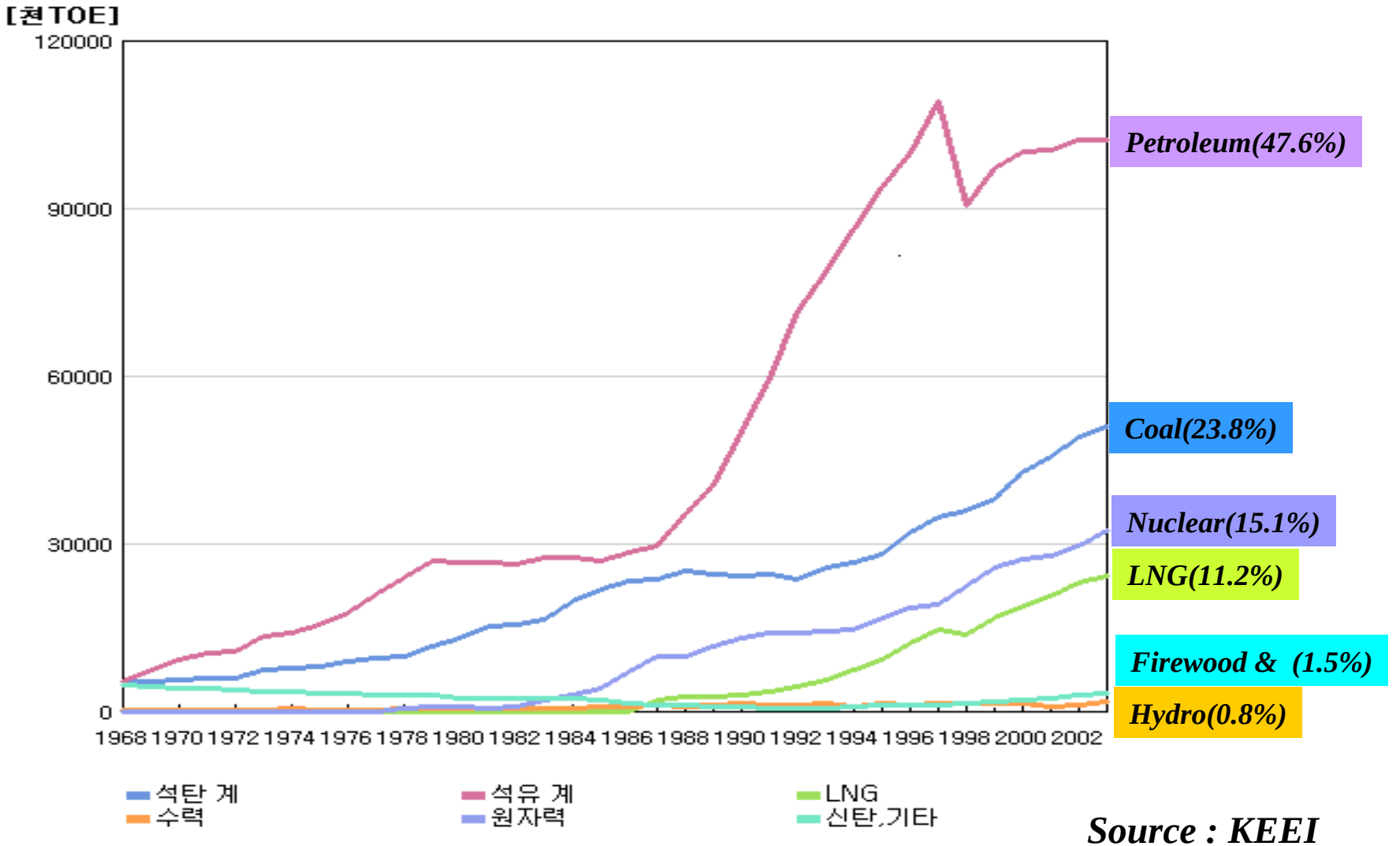
Source : MOCIE

1.2 Perspectives of Economic indicators

2003 Economic Outlook								2003
	KDI	KIET	Samsung	LG	Hyundai	IMF	OECD	
GDP	5.3	5.6	5~5.9	5.6	5.7	5.9	5.8	3.1
Private Consumption	4.4	5.2	4.8	5.0	5.9	-	4.4	-1.4
Current Account($100mil.)	23	-	11.8	-6	0~9	50	54	-
Consumer Price	3.3	3.0	3.6	3.1	3.5	3.3	3.5	3.6
Unemployment Rate	3.2	-	-	2.9	3.1	-	2.8	3.4

Source : KDI

1.3 Primary Energy Consumption

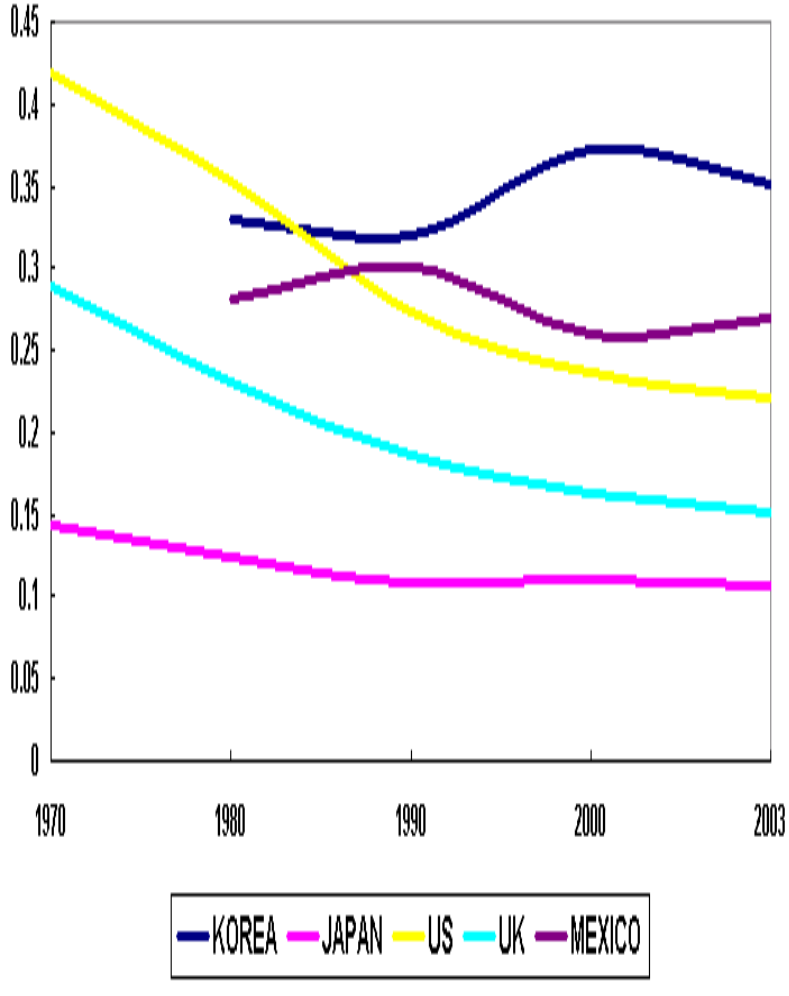


Source : KEEI

1.4 TOE/1000$ in OECD Country

	1970	1980	1990	2000	2003
KOREA	-	0.329	0.321	0.373	0.351
JAPAN	0.143	0.124	0.108	0.111	0.106
US	0.419	0.353	0.273	0.236	0.221
UK	0.289	0.231	0.187	0.162	0.152
MEXICO	-	0.281	0.301	0.259	0.270
OECD	-	0.278	0.228	0.208	0.201
IEA	-	0.271	0.222	0.204	0.197

Source : IEA Energy Balances of OECD Country



1.5 Energy Indicators

	2000	2005	2010	2015
Population(mil)	47.0	48.5	49.5	50.2
GDP(2000Price) (Tril. KRW)	578.7	733.5	931.8	1,127.4
Primary Energy Consumption (mil toe)	192.9	229.6	272.7	299.3
CO2 Emission(t-CO2 mil)	118.4	138.7	162.4	175.8
PEC/GDP(toe/mil 1,000$)	0.373	0.313	0.293	0.265
CO2 Emission/GDP	0.205	0.189	0.174	0.156
PEC/Population	4.104	4.734	5.509	5.962
CO2 Emission/Population	2.519	2.860	3.281	3.502

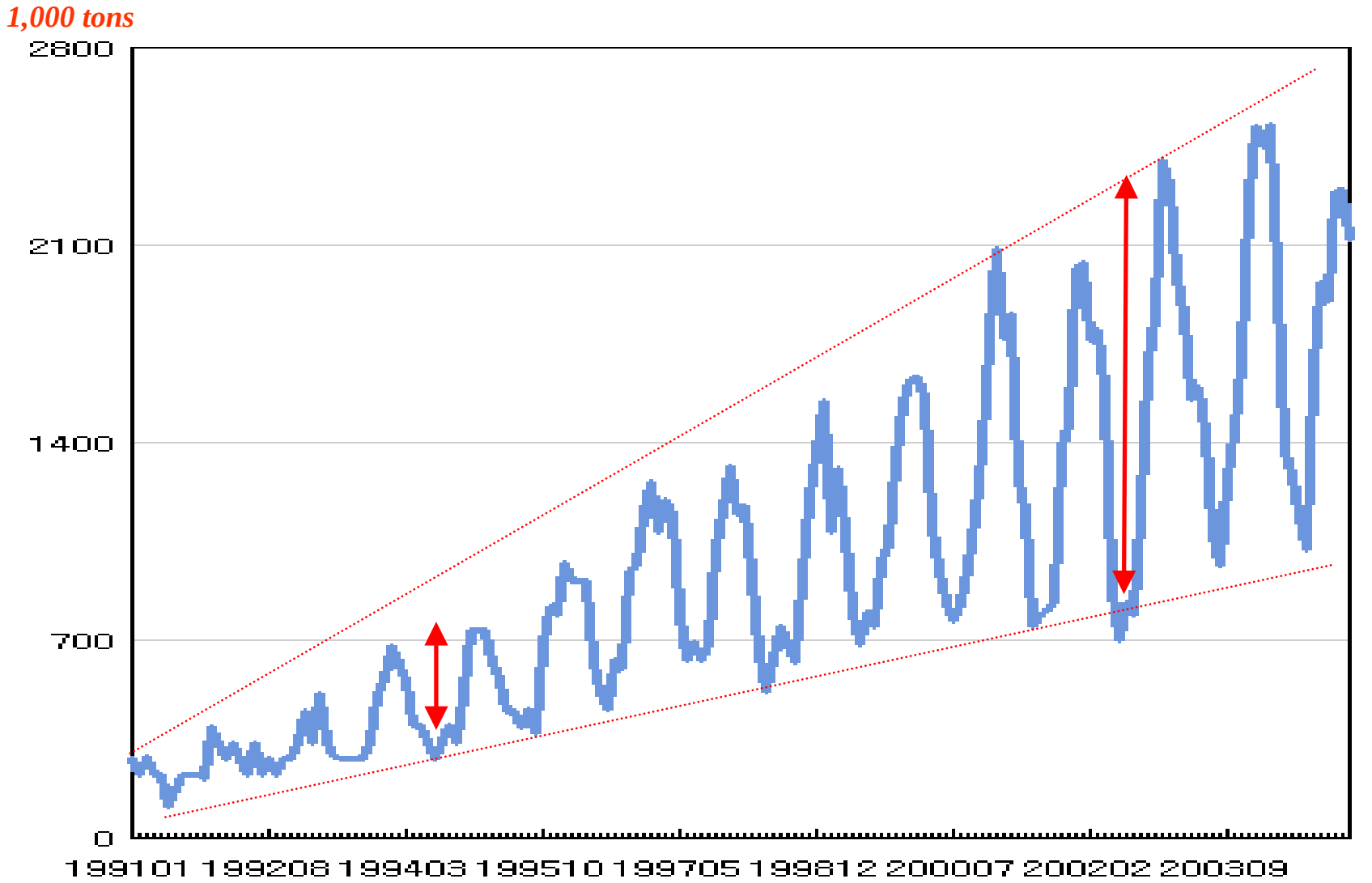
Source : KEEI

2. Natural Gas Demand in Korea

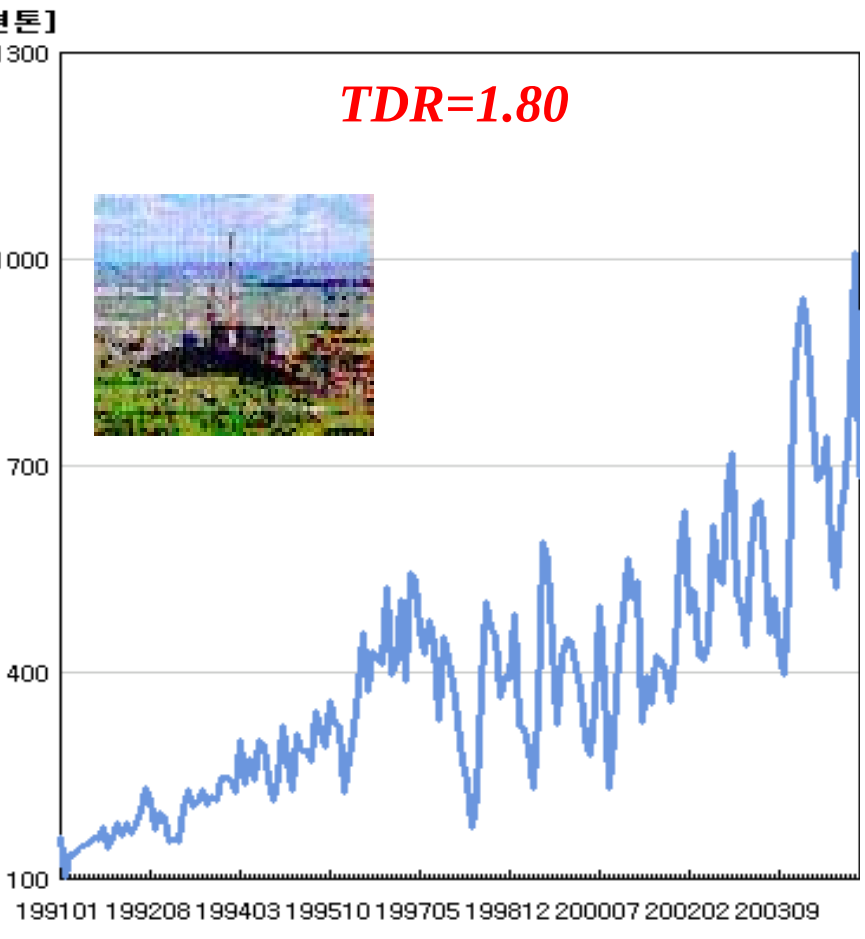
2.1 The 7th Long-term Demand Forecasting of Natural ga

	City-gas				Electric	total
	Residential	commercial	industrial	Sub-total		
2003	6,457	2,198	3,324	11,979	6,468	18,447
2004	6,971	2,387	3,487	12,845	8,241	21,086
2005	7,328	2,572	3,758	13,658	7,898	21,556
2006	7,686	2,768	4,052	14,506	8,390	22,896
2007	8,043	2,974	4,369	15,386	9,249	24,635
2008	8,400	3,191	4,709	16,300	8,245	24,545
2009	8,699	3,391	5,039	17,129	7,185	24,314
2010	8,997	3,598	5,388	17,983	7,639	25,622
2011	9,289	3,808	5,755	18,852	7,347	26,199
2012	9,585	4,027	6,147	19,759	6,277	26,036
2013	9,887	4,257	6,565	20,709	6,357	27,066
2014	10,194	4,496	7,010	21,700	6,251	27,951
2015	10,503	4,742	7,477	22,722	6,683	29,405
2016	10,815	5,000	7,972	23,787	6,539	30,326
2017	11,130	5,269	8,494	24,893	6,761	31,654
AAGR	) 3.97%	6.44%	6.93%	5.36%	0.32%	3.93%

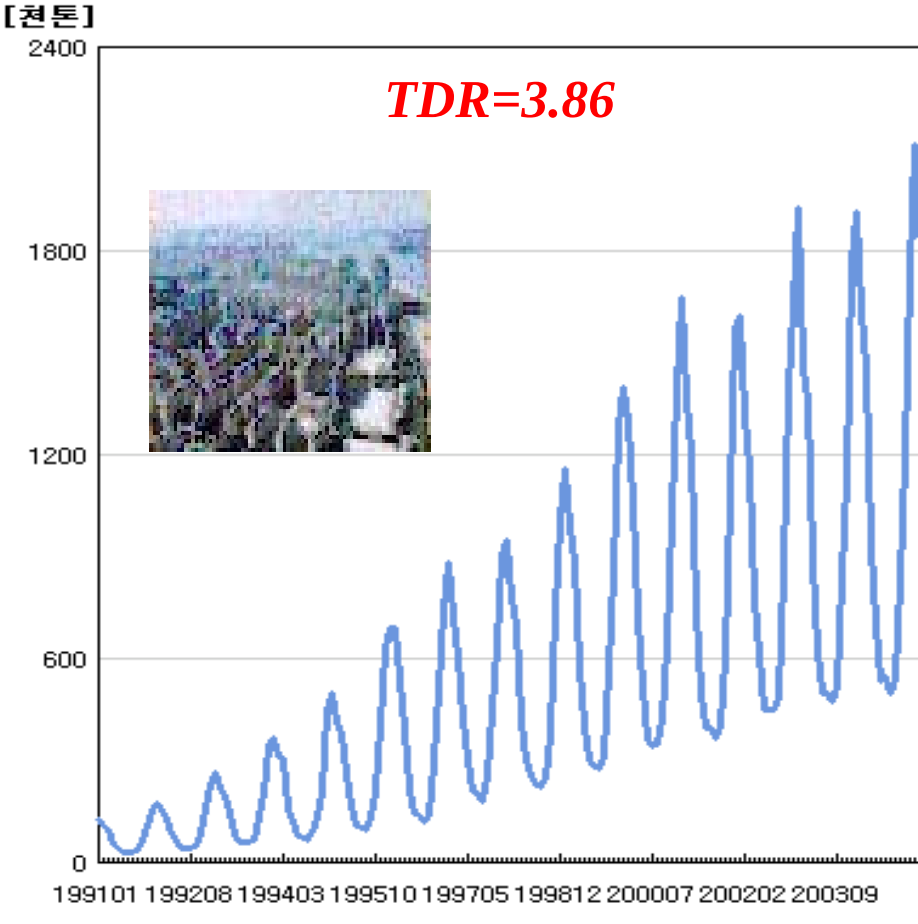
2.2. The Gap between Low & High Demand



2.3 The pattern of Gas Demand



Demand pattern for Electricity



Demand pattern for City Gas

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3. Natural Gas demand- Supply Balance and the role of LNG spot cargo

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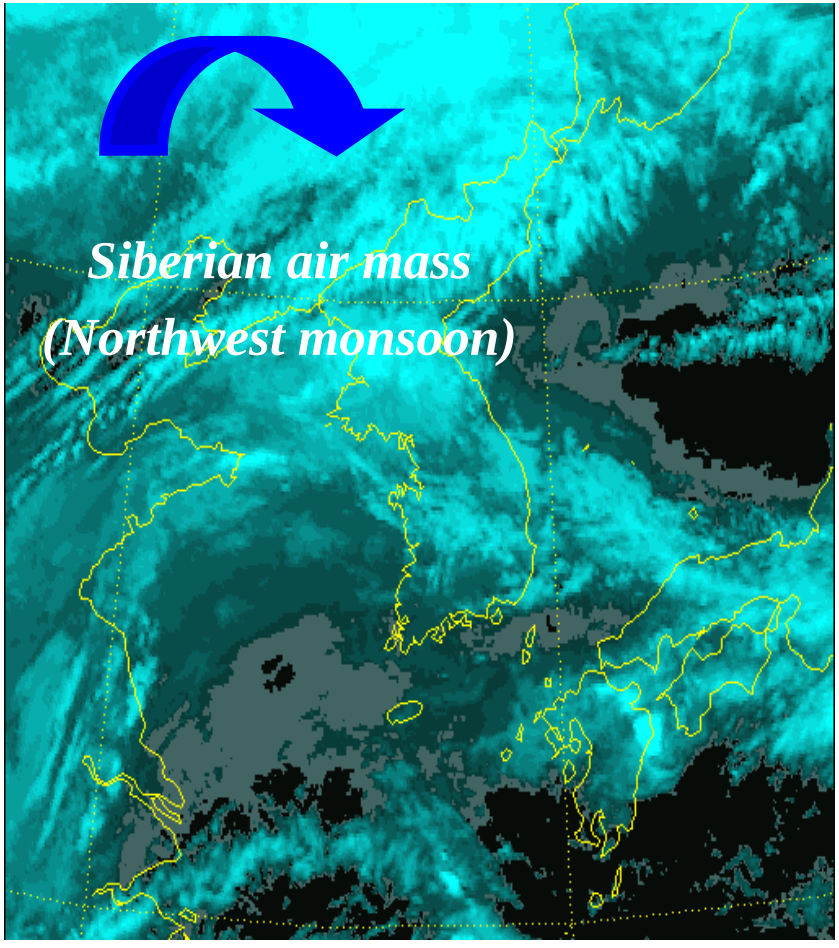
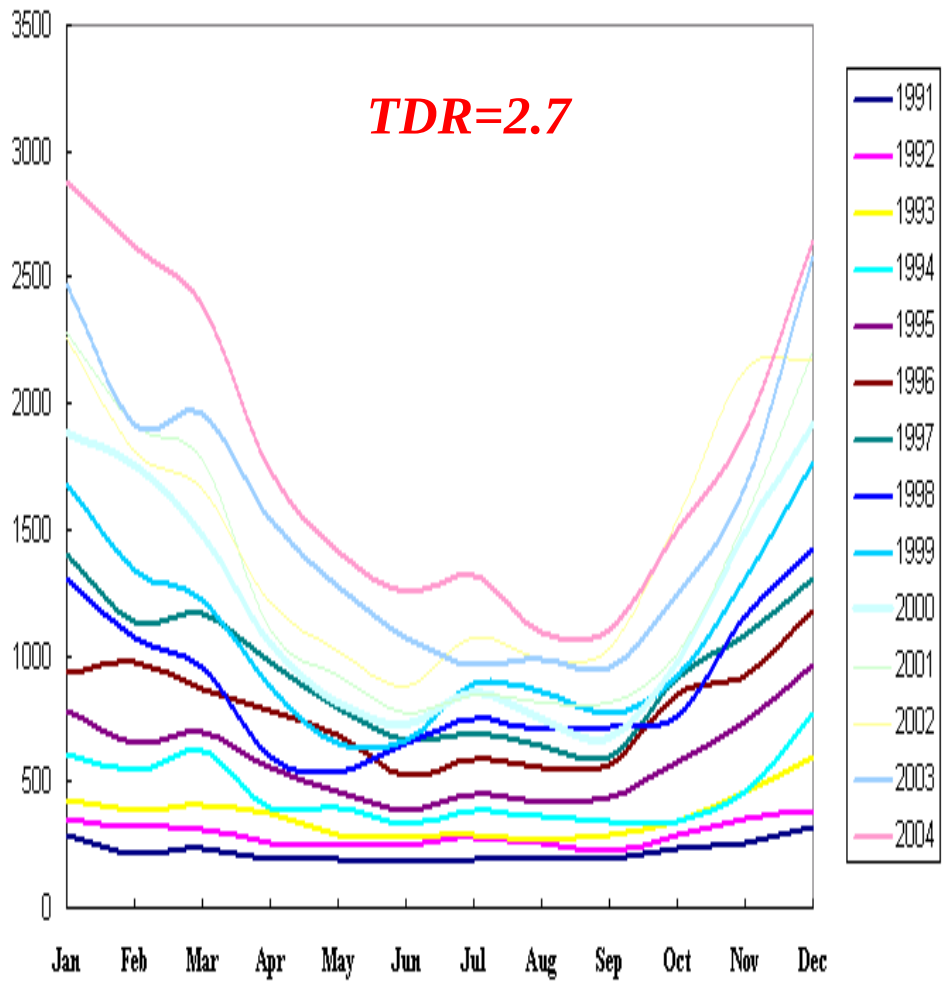
3.1 LNG Contracts

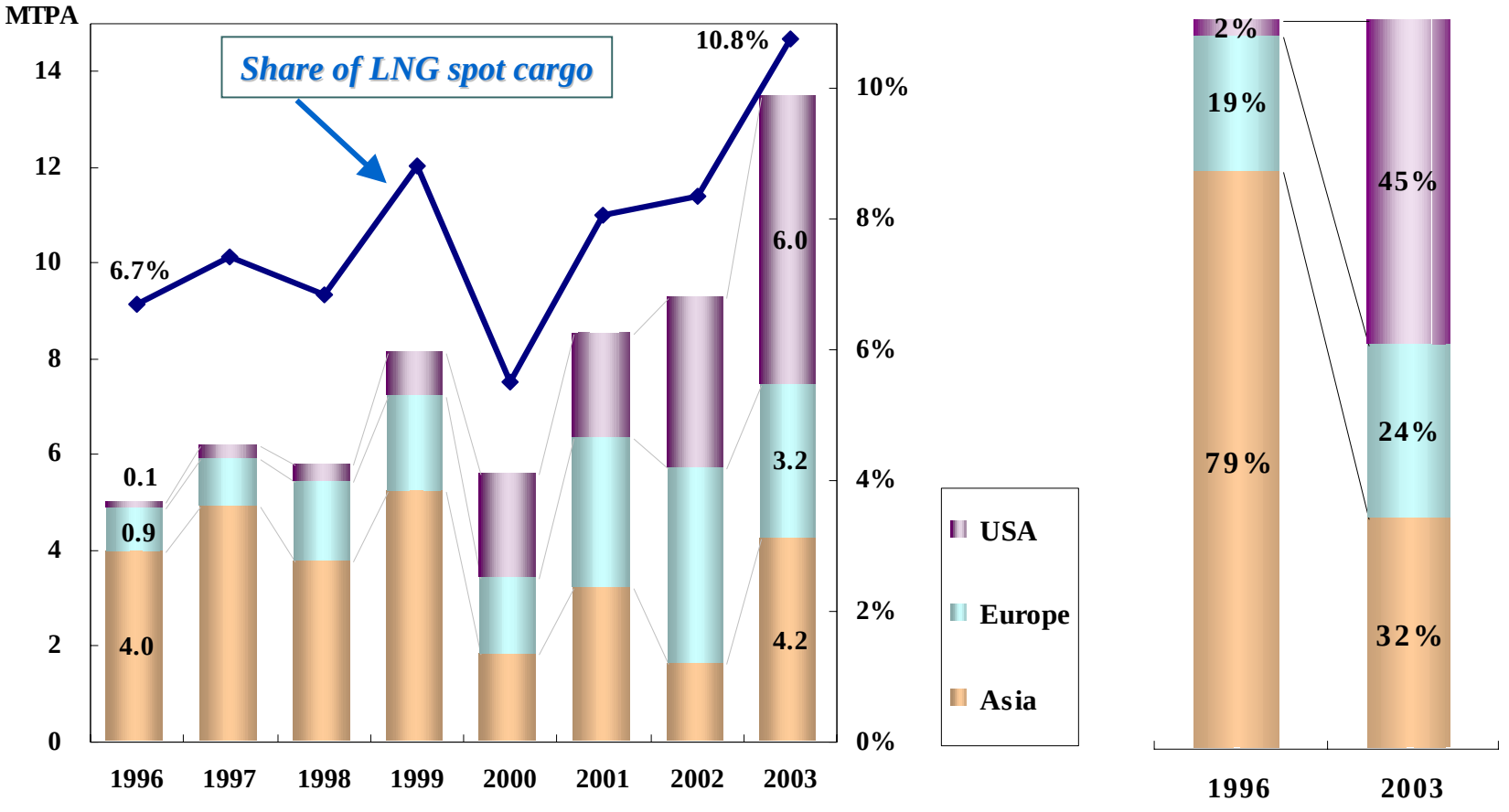
Contract	Country	Project	MPTA (10,000Tons)	Share (%)	Period	Delivery Condition	Winter (%)
L (Except POSCO/SK Contract)	Indonesia	ARUN III	230	8.4	'86 ～'07	Ex-Ship	50
		KOREA II	200	7.3	'94 ～'14	FOB	50
		BADAK V	100	3.6	'98 ～'17	FOB	50
	Malaysia	MLNG II	200	7.3	'95 ～'15	FOB	50
		MLNG III*	150+50(opt)	7.3	'08 ～'28	Ex-Ship	70
	Qatar	Ras Laffan	492	17.9	'99 ～'24	FOB	50
	Oman	OLNG	406	14.8	'00 ～'24	FOB	53
	Russia	Sakhalin II*	150	5.5	'08 ～'28	FOB	70
	Yemen	YLNG*	200	7.3	'08 ～'28	FOB	50
	Brunei	BLNG	70	2.5	'97 ～'13	Ex-Ship	70
	Korea	East-Sea	40	1.5	'04 ～'18	PNG	75
M	Malaysia	MLNG III	150+50(opt)	7.3	'03 ～'10	Ex-Ship	80
	Australia	NWS	50	1.8	'03 ～'10	Ex-Ship	100
S	Qatar	Ras Laffan	96(average)	3.5	'04 ～'08	Ex-Ship	86
	Malaysia	MLNG III	71(average)	2.5	'04 ～'08	Ex-Ship	53
		MLNG II	40(average)	1.5	'05 ～'08	Ex-Ship	80

3.2 Gas Shortage problem in Winter





3.3 The trend of World LNG Spot market



note) Involving the middle term Contracts (less than 5 years)

Source : KOGAS

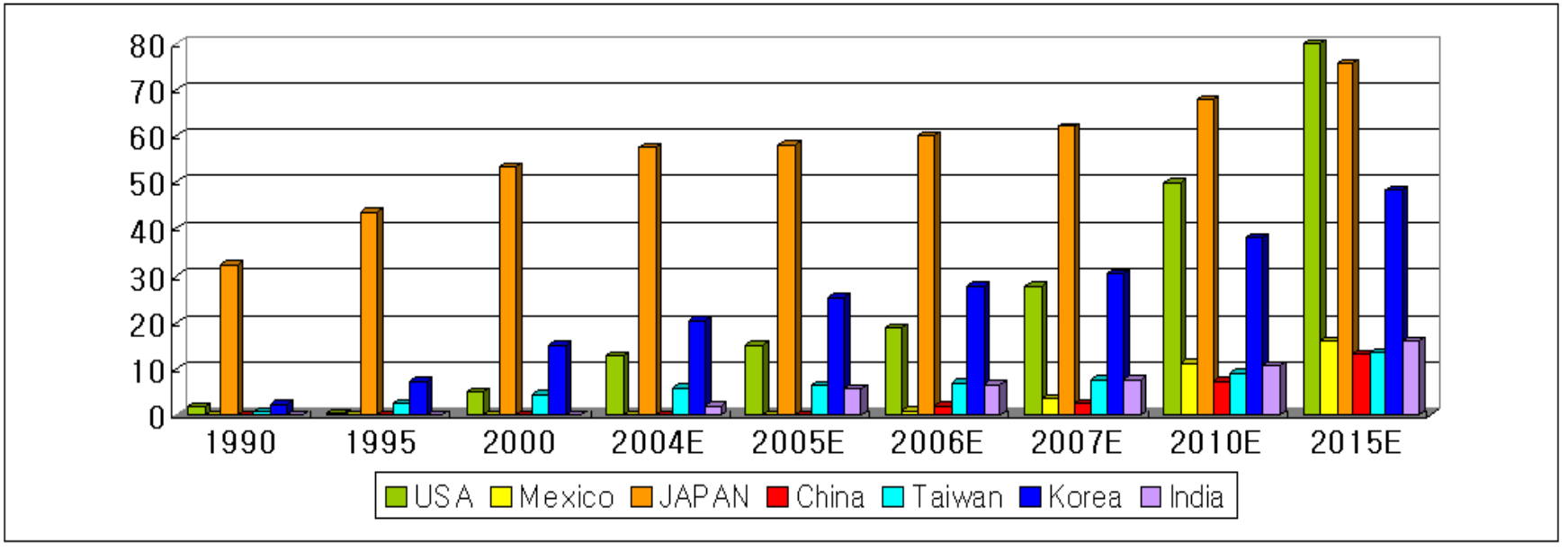
4. What will be occurring in Korea LNG market in the future?

4.1 Several conditions of an Emergency Outbreak in Demand-Supply Balance

1. Seasonality problem in Korea
2. Specially Cold Winter
3. Unexpected Increasing of LNG spot demand
4. Continuous High Oil Price
5. Structural difference between two Gas Market
6. Limitation of LNG storage tank Capacity
7. Unstable Liquefaction Plant
8. No surplus LNG spot cargoes

4.2 Pay attention to US LNG market

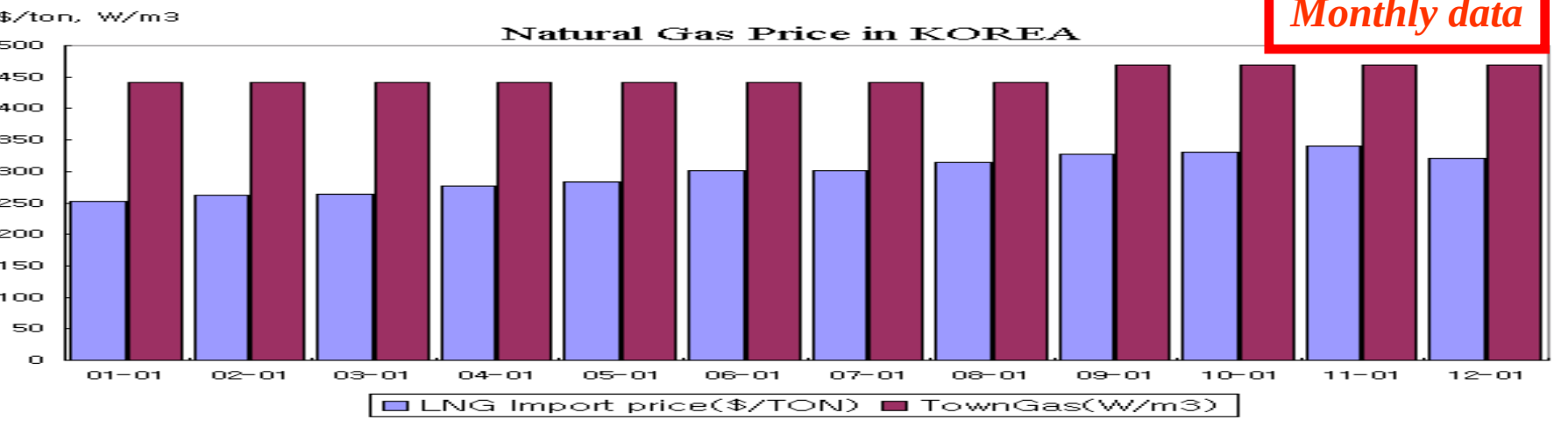
	1990	1995	2000	2004E	2005E	2006E	2007E	2010E	2015E
USA	1.7	0.4	4.9	12.7	15	18.7	27.7	50	80
Mexico	0	0	0	0	0	0.9	3.6	11.3	15.8
JAPAN	32.4	43.5	53.4	57.7	58.3	60.2	62.1	67.8	75.6
China	0	0	0	0	0	2	2.5	7.1	13
Taiwan	0.7	2.5	4.3	5.9	6.4	6.9	7.4	9	13.5
Korea	2.1	7.1	15	20.2	25.2	27.8	30.4	38.1	48.4
India	0	0	0	2	5.7	6.6	7.6	10.5	16



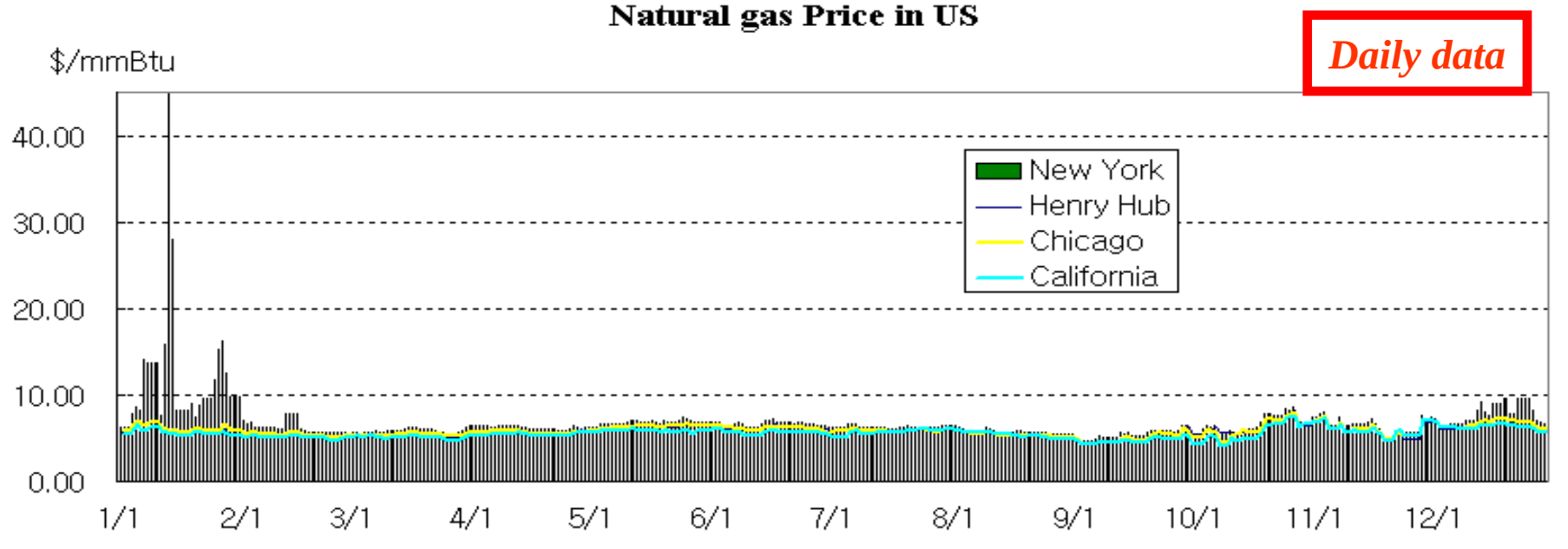
Source : Deutsch Bank

4.3 Difference of gas price system

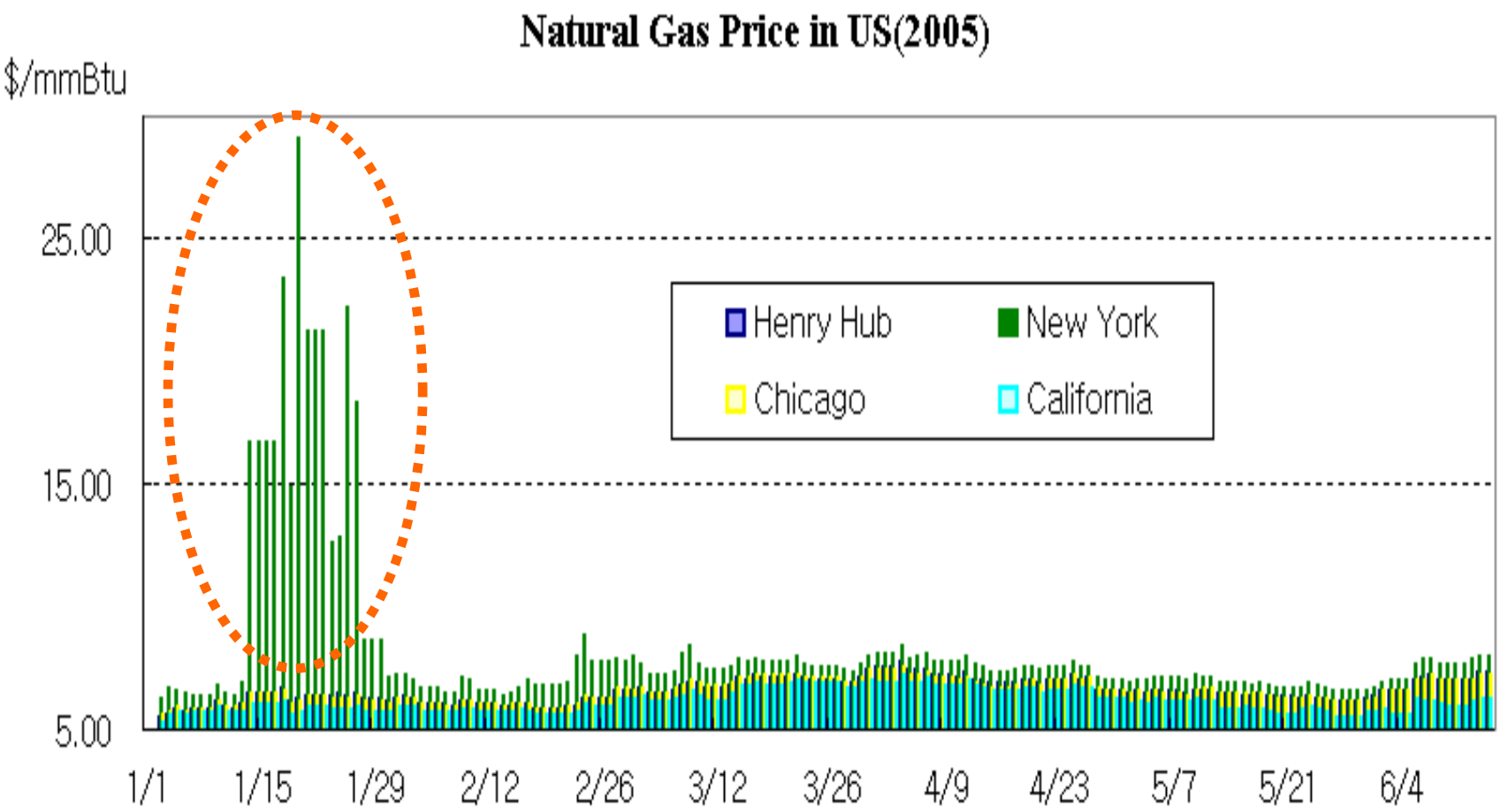
Monthly data



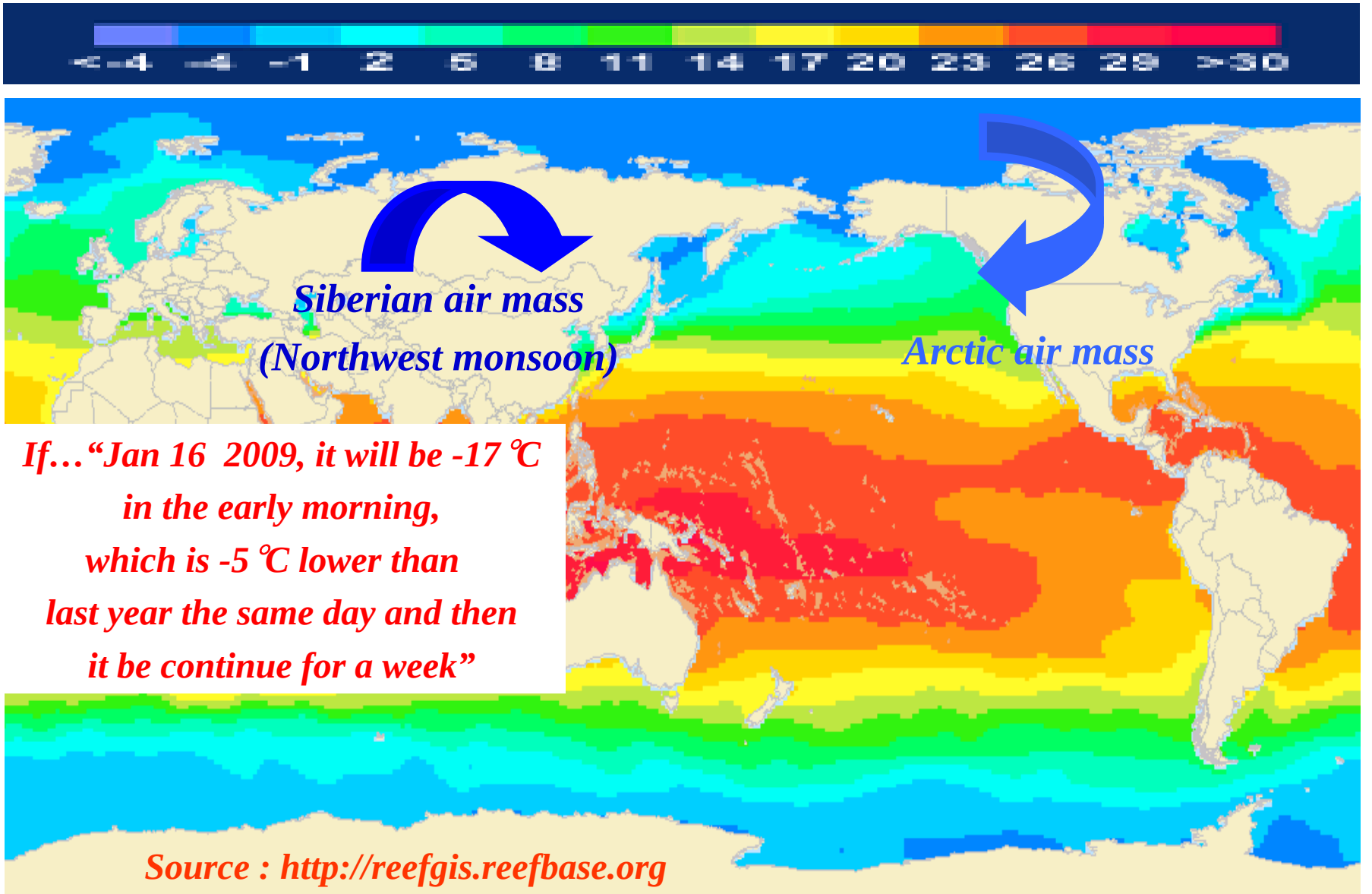
Daily data



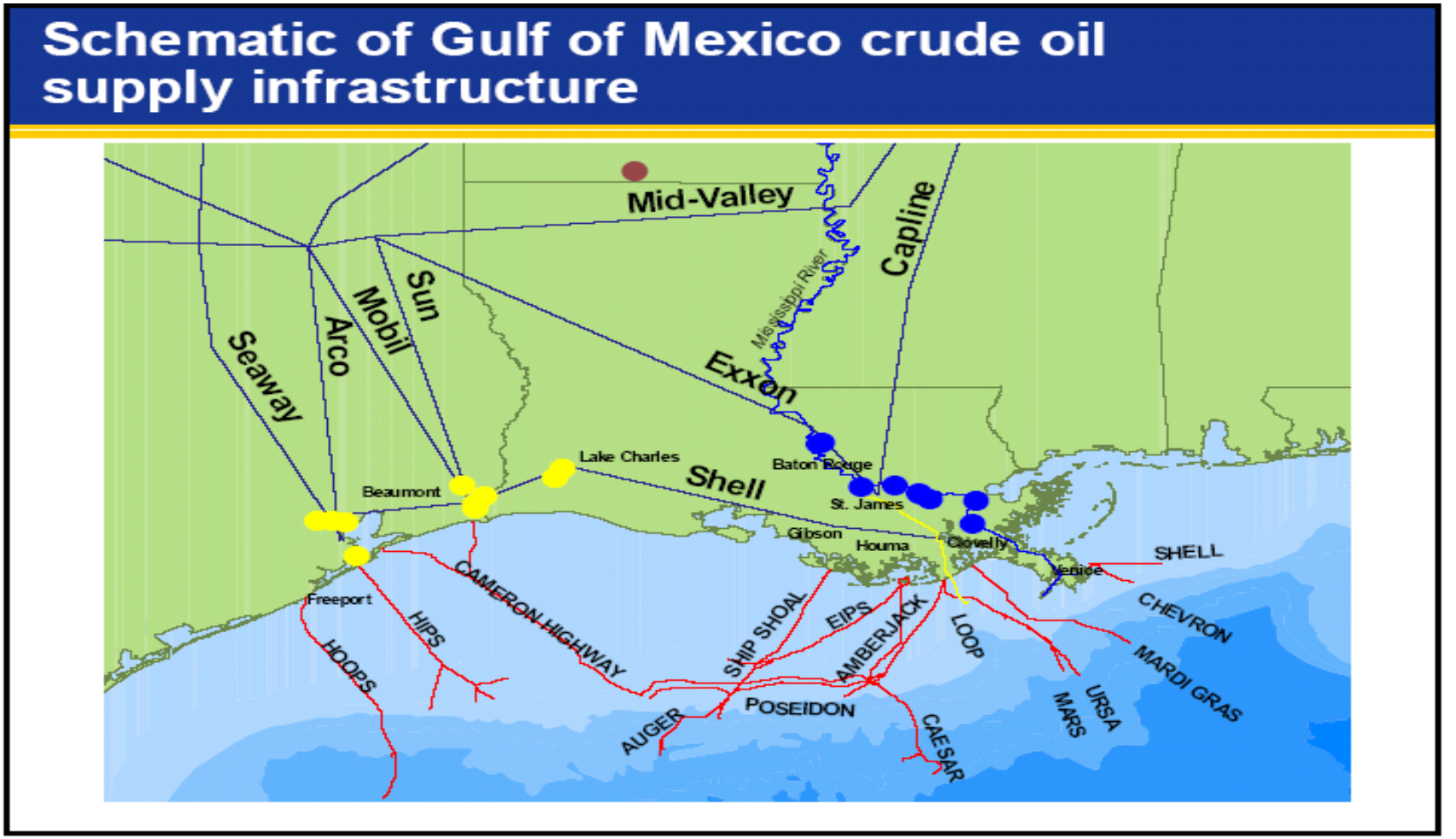
Gas price on January in US



4.4 The temperature of Asia-Pacific on January



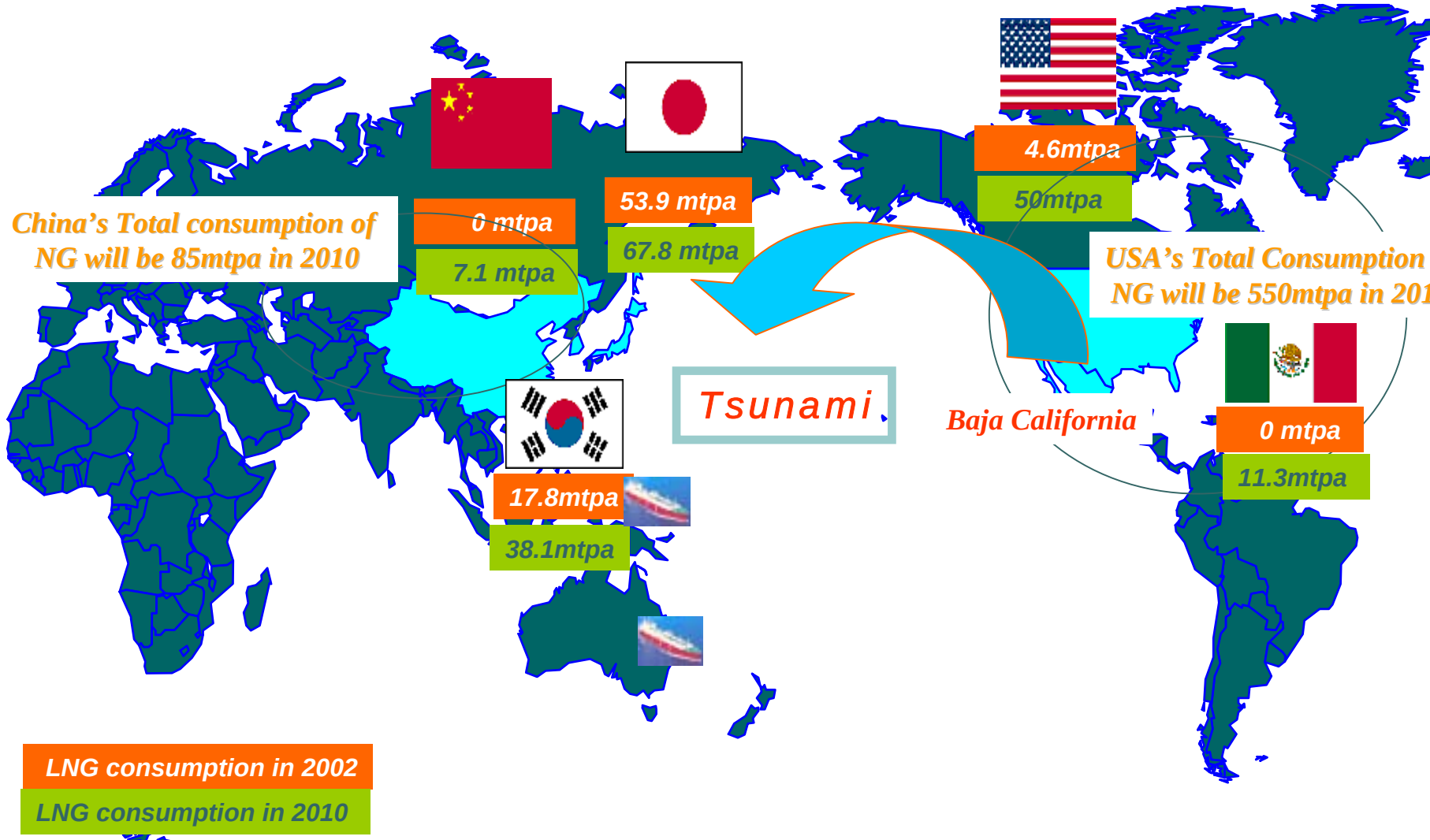
A Natural disaster : Hurricane Katrina's Impact on the Energy Industry



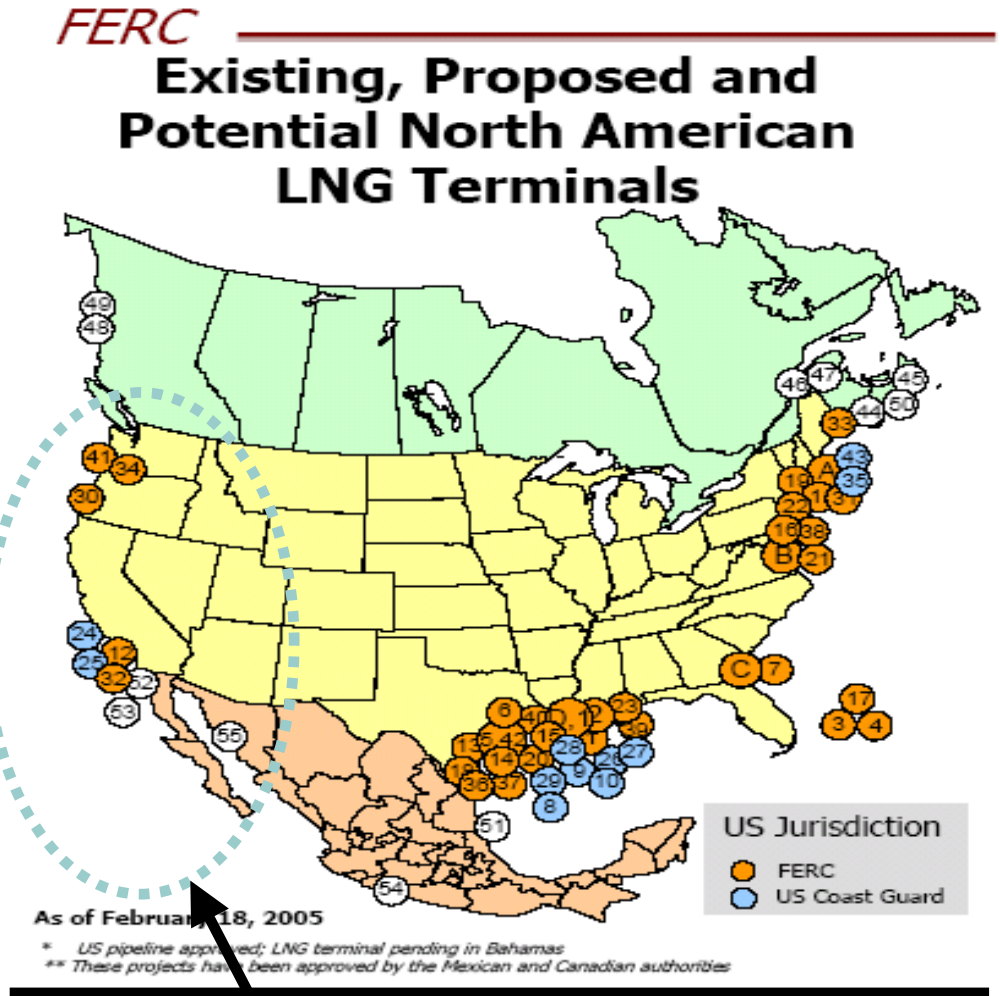
Crisis created along the Gulf Coast by Hurricane Katrina.

Source : Purvin & Gertz, Inc.

4.5 The future of Asia-Pacific LNG market



US ; The Master plan of LNG Terminals



Constructed
A. Everett, MA : 1.035 Bcfd (Tractebel - DOMAC)
B. Cove Point, MD : 1.0 Bcfd (Dominion - Cove Point LNG)
C. Elba Island, GA : 0.68 Bcfd (El Paso - Southern LNG)
D. Lake Charles, LA : 1.0 Bcfd (Southern Union - Trunkline LNG)

Approved by FERC
1. Lake Charles, LA: 1.1 Bcfd (Southern Union - Trunkline LNG)
2. Hackberry, LA : 1.5 Bcfd, (Sempra Energy)
3. Bahamas : 0.84 Bcfd, (AES Ocean Express)*
4. Bahamas : 0.83 Bcfd, (Calypso Tractebel)*
5. Freeport, TX : 1.5 Bcfd, (Cheniere/Freeport LNG Dev.)
6. Sabine, LA : 2.6 Bcfd (Cheniere LNG)
7. Elba Island, GA: 0.54 Bcfd (El Paso - Southern LNG)

Approved by MARAD/Coast Guard
8. Port Pelican: 1.6 Bcfd, (Chevron Texaco)
9. Gulf of Mexico: 0.5 Bcfd, (El Paso Energy Bridge GOM, LLC)
10. Louisiana Offshore : 1.0 Bcfd (Gulf Landing - Shell)

Proposed to FERC
11. Fall River, MA : 0.8 Bcfd, (Weaver's Cove Energy/Hess LNG)
12. Long Beach, CA : 0.7 Bcfd, (Mitsubishi/ConocoPhillips - Sound Energy Solutions)
13. Corpus Christi, TX : 2.6 Bcfd, (Cheniere LNG)
14. Corpus Christi, TX : 1.0 Bcfd (Vista Del Sol - ExxonMobil)
15. Sabine, TX : 1.0 Bcfd (Golden Pass - ExxonMobil)
16. Logan Township, NJ : 1.2 Bcfd (Crown Landing LNG - BP)
17. Bahamas : 0.5 Bcfd, (Seafarer - El Paso/FPL)
18. Corpus Christi, TX: 1.0 Bcfd (Ingleside Energy - Occidental Energy Ventures)
19. Providence, RI : 0.5 Bcfd (Keyspan & BG LNG)
20. Port Arthur, TX: 1.5 Bcfd (Sempra)
21. Cove Point, MD : 0.8 Bcfd (Dominion)
22. LI Sound, NY: 1.0 Bcfd (Broadwater Energy - TransCanada/Shell)
23. Pascagoula, MS: 1.0 Bcfd (Gulf LNG Energy LLC)

Proposed to MARAD/Coast Guard
24. California Offshore: 1.5 Bcfd (Cabrillo Port - BHP Billiton)
25. So. California Offshore : 0.5 Bcfd, (Crystal Energy)
26. Louisiana Offshore : 1.0 Bcfd (Main Pass McMoRan Exp.)
27. Gulf of Mexico: 1.0 Bcfd (Compass Port - ConocoPhillips)
28. Gulf of Mexico: 2.8 Bcfd (Pearl Crossing - ExxonMobil)
29. Gulf of Mexico: 1.5 Bcfd (Beacon Port Clean Energy Terminal - ConocoPhillips)

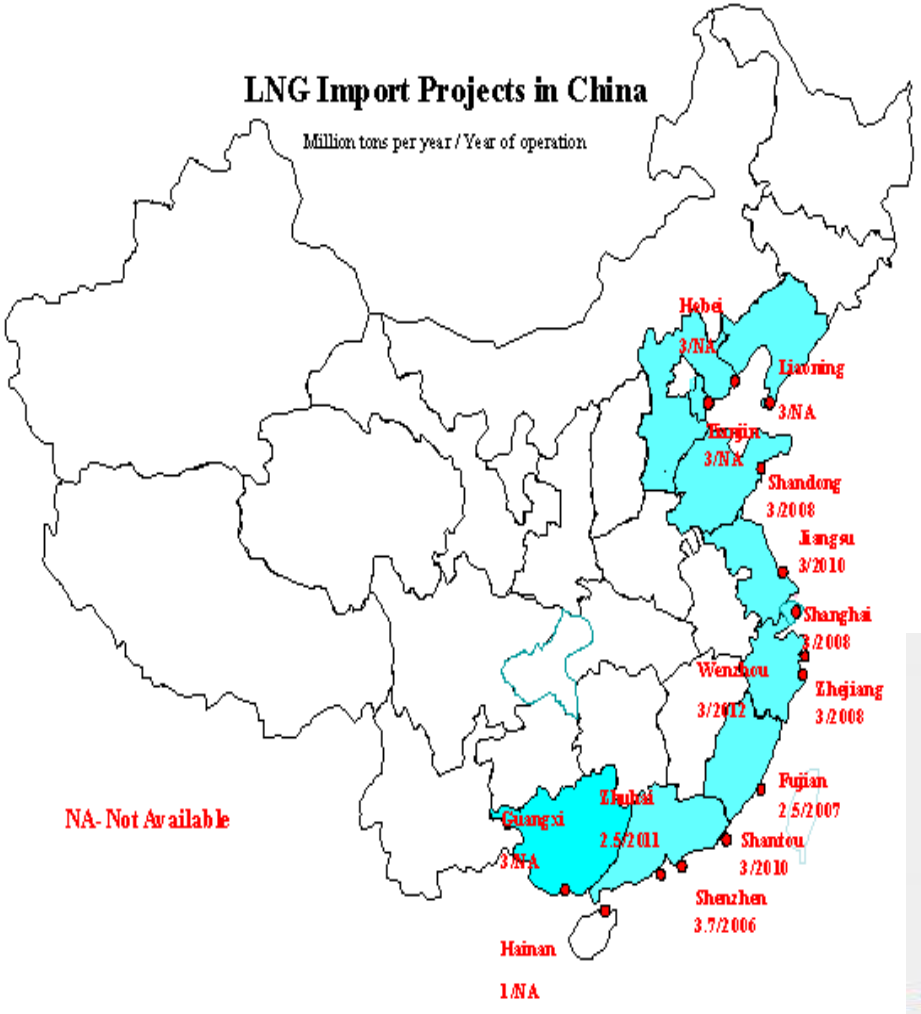
Potential Sites Identified by Project Sponsors
30. Coos Bay, OR: 0.13 Bcfd, (Energy Projects Development)
31. Somerset, MA: 0.65 Bcfd (Somerset LNG)
32. California - Offshore: 0.75 Bcfd, (Chevron Texaco)
33. Pleasant Point, ME : 0.5 Bcf/d (Quoddy Bay, LLC)
34. St. Helens, OR: 0.7 Bcfd (Port Westward LNG LLC)
35. Offshore Boston, MA: 0.8 Bcfd (Northeast Gateway - Excelerate Energy)
36. Galveston, TX: 1.2 Bcfd (Pelican Island - BP)
37. Port Lavaca, TX: 1.0 Bcfd (Calhoun LNG - Gulf Coast LNG Partners)
38. Philadelphia, PA: 0.6 Bcfd (Freedom Energy Center - PGW)
39. Pascagoula, MS: 1.3 Bcfd (ChevronTexaco)
40. Cameron, LA: 3.3 Bcfd (Creole Trail LNG - Cheniere LNG)
41. Astoria, OR: 1.0 Bcfd (Skipanon LNG - Calpine)
42. Freeport, TX: 1.5 Bcfd, (Cheniere/Freeport LNG Dev. - Expansion)
43. Offshore Boston, MA: 0.4 Bcfd (Neptune LNG - Tractebel)

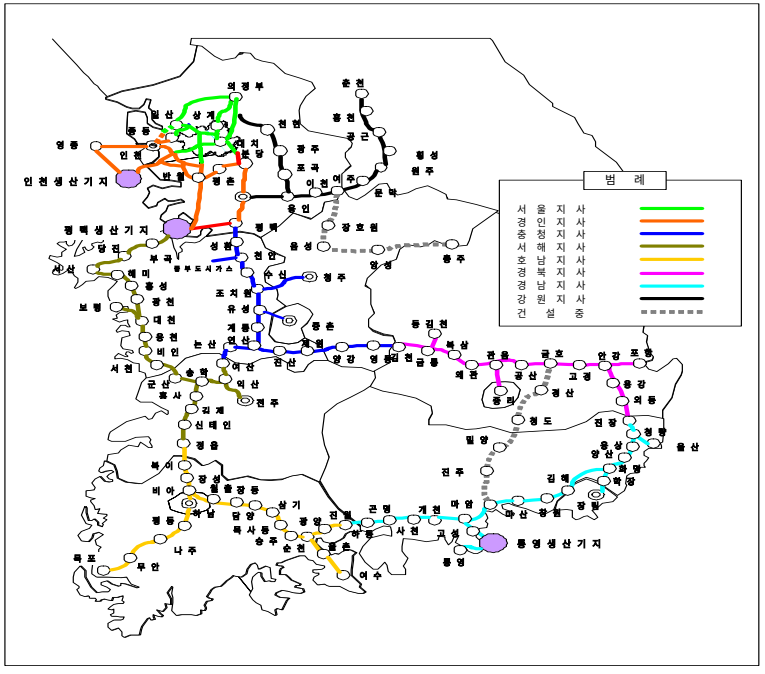
Canadian Approved and Potential Terminals
44. St. John, NB : 1.0 Bcfd, (Canaport - Irving Oil)
45. Point Tupper, NS 1.0 Bcf/d (Bear Head LNG - Anadarko)
46. Quebec City, QC : 0.5 Bcfd (Project Rabaska - Enbridge/Gaz Met/Gaz de France)
47. Rivière-du- Loup, QC: 0.5 Bcfd (Cacouna Energy - TransCanada/PetroCanada)
48. Kitimat, BC: 0.61 Bcfd (Galveston LNG)
49. Prince Rupert, BC: 0.30 Bcfd (WestPac Terminals)
50. Goldboro, NS 1.0 Bcfd (Keltic Petrochemicals)

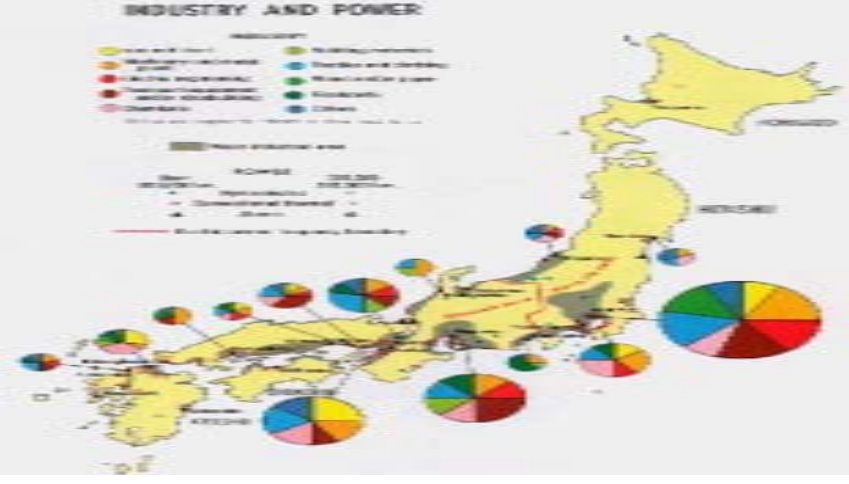
Mexican Approved and Potential Terminals
51. Altamira, Tamulipas : 0.7 Bcfd, (Shell/Total/Mitsui)**
52. Baja California, MX : 1.0 Bcfd, (Sempra & Shell)**
53. Baja California - Offshore : 1.4 Bcfd, (Chevron Texaco)
54. Lázaro Cárdenas, MX : 0.3 Bcfd (Tractebel/Repsol)
55. Puerto Libertad, MX: 1.3 Bcfd (Sonora Pacific LNG)

The seismic center of Tsunami in Asia-Pacific LNG Market

4.6. How to escape from Tsunami?







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