THE GROWING COMPETITION BETWEEN PIPELINES AND LNG FOR GAS MARKETS

a presentation to

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DESPITE GEOGRAPHY THAT PRECLUDES MANY TRADES, LNG AND PIPELINE PROJECTS ARE NOW COMPETING IN A NUMBER OF MARKETS

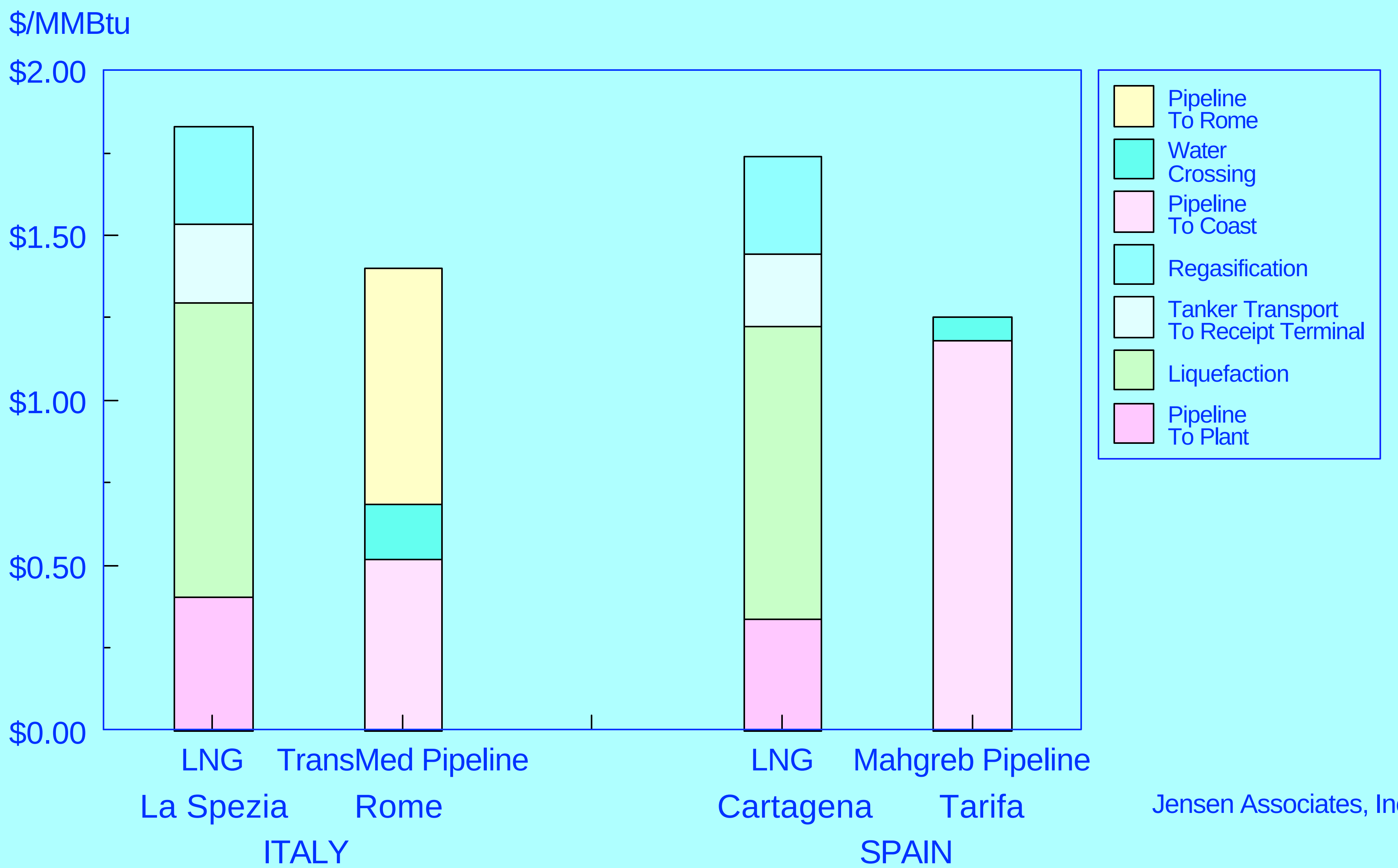
- Recently, Pipeline and LNG Projects Have Been in Competition in Such Far-Flung Markets As Spain, Turkey, the Indian Subcontinent, the ASEAN Region, China and Even Japan and Korea

COMPETITION BETWEEN PIPELINES AND LNG IS CERTAINLY NOT NEW

- LNG Was Initially Selected for the Trades From Algeria and Libya to Southern Europe Largely Because the Technology to Lay Pipelines Across Mediterranean Did Not Exist at the TIme
- Once The Problem of Deep Water Crossing Was Solved in 1977 with the TransMed Pipeline, the Emphasis Shifted Away From LNG to Pipelining for Italy and the Iberian Peninsula
- As Illustrated in the Following Estimates, Pipelining Over These Short Distances is Cheaper Than LNG

ILLUSTRATIVE COSTS OF DELIVERING GAS FROM ALGERIA (HASSI R'MEL) TO ITALY AND SPAIN

ESTIMATES ASSUME ORIGINAL PIPELINE DESIGN SIZING, TWO TRAIN LNG PLANTS, PRESENT CONSTRUCTION COSTS AND 90% LOAD FACTOR OPERATION



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THE MEDITERRANEAN CROSSING IS WHAT MIGHT BE TERMED "TRANSPORTATION COMPETITION"

- The Source of Supply and the Market Are Established; The Only Issue Is, "Which Is the More Economic Method of Delivering the Gas?"

- This Type of Competition Is Comparatively Uncommon; After All, What Competition Does LNG Offer For Movements From West Siberia to Germany, or Pipelining Offer For Movements From the Middle East to Japan?

HOWEVER, THE NEWER AND INCREASINGLY COMMON TYPE OF COMPETITION MIGHT BE TERMED "PROJECT COMPETITION"

- In It, Transportation is Only One Part of an Overall Package in Competing Supply Projects
- The Projects Are Based on Different Gas Sources and May Well Deliver to Different Destinations Within the Larger Market
- In These Cases, Competitive Economics Are Complex, Since They Depend Not Only on the Relative Costs of Transportation, But Those of Competing Supplies and Those of Downstream Distribution Within the Destination Market, as Well

- Current Examples Include:
  - Trinidad LNG Versus the Mahgreb Pipeline to Spain
  - Algerian and Egyptian LNG to Turkey Versus
    Russian, Iranian, Turkmen and Azeri Pipelines
  - Various Pipeline Proposals for the Indian
    Subcontinent Versus LNG
  - Russian, Kazakh and Turkmen Pipelines for China
    Versus LNG
  - A Sakhalin Pipeline for Japan Versus LNG

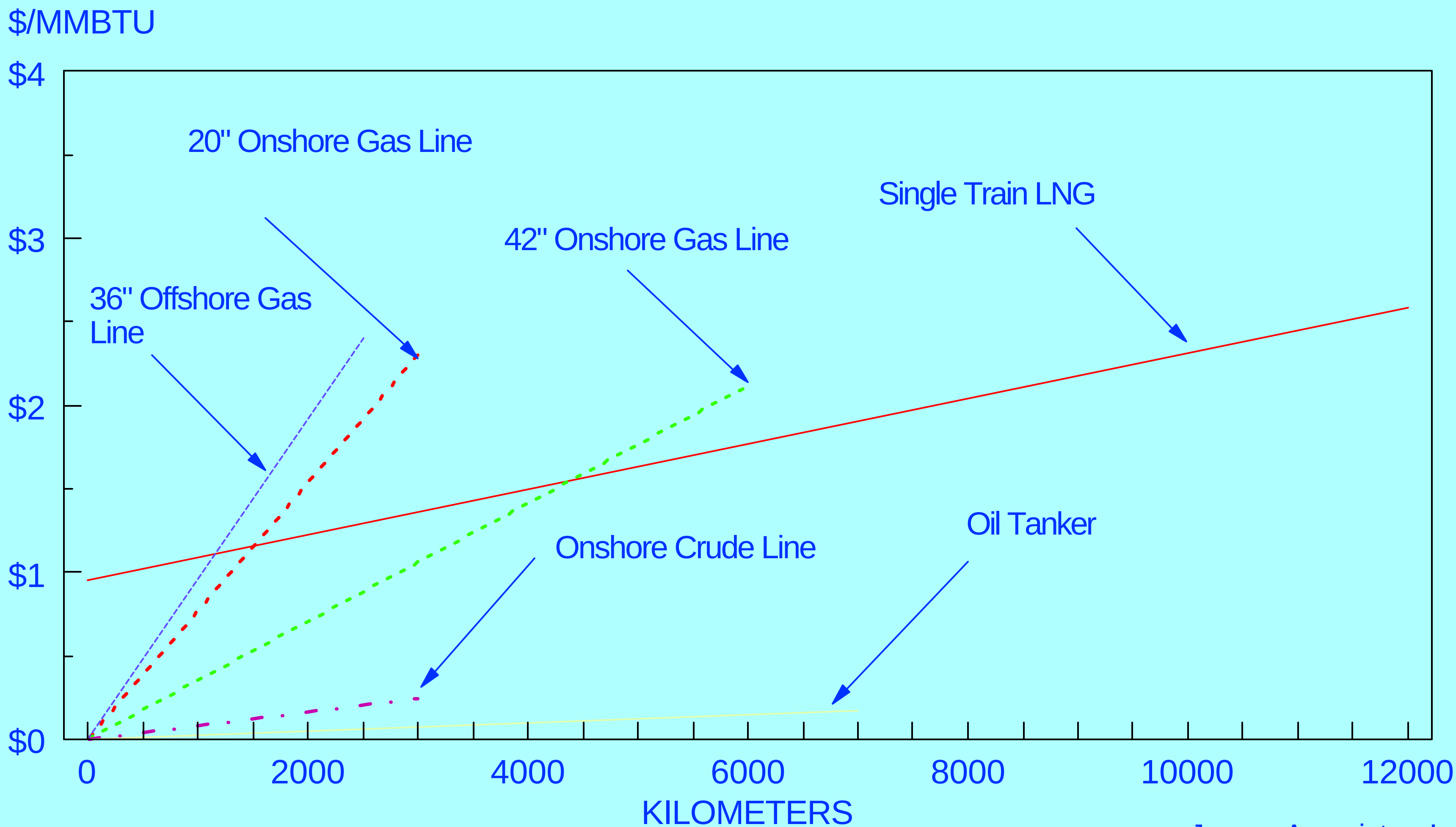
- Some of These Projects Can Interact With One Another Within the Market, Making the Economics of One Dependent on Whether or Not the Other Goes Forward

- In Some Cases, the Layout of the Initial Project Defines the Configuration of the Ultimate Delivery Infrastructure Within the Market

THREE CHARACTERISTICS OF NATURAL GAS HAVE HISTORICALLY DETERMINED THE WAY IN WHICH INTERNATIONAL GAS MARKETS DEVELOP

- High Transportation Costs
- A Relatively Inflexible Transportation and Delivery System
- Substantial Economies of Scale in Transportation and Distribution

REPRESENTATIVE COSTS OF TRANSPORTATION
GAS VERSUS OIL



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IMPLICATIONS FOR INTERNATIONAL GAS TRADE

- It Has Usually Taken Large Markets to Justify the Major International Transportation Systems
- Small Discoveries and Small Markets Have Been Difficult to Commercialize
- Many Gas Discoveries Have No Economic Outlet - "Stranded Gas" (Who Ever Heard of "Stranded Oil"?)

TODAY'S THREE MAJOR INTERNATIONAL PIPELINE SYSTEMS - THE NORTH AMERICAN (NAFTA), WEST EUROPEAN AND FSU GRIDS - OVERCAME THESE DISADVANTAGES BY AN EVOLUTIONARY PROCESS

- They Were Initially Able to Link Nearby Markets with Nearby Resources

- For the Most Part, These Systems Serve Large, Energy-Intense Economies

- They Were Thus Able to Use Their Strong Energy Demand to Build on the Existing Infrastructure and Seek Out New Supplies as the Market Developed

FOR LNG, THE ASIAN MARKETS IN JAPAN, KOREA AND TAIWAN WERE EARLY MAJOR SUCCESS STORIES

- These Markets Were Able to Overcome Gas's Transportation Disadvantages by Focussing on Power Generation
- They Pioneered the Use of Gas-Fired Combined Cycle Gas Turbine (CCGT) Power Generation Units

- By Creating Large Markets That Could Pay Premium Prices for the Fuel, CCGT Technology Enabled Gas to Break Out of Its Twin Constraints in Serving Distant Markets

  Its Premium Loads Developed Too Slowly to Justify New Transportation Projects

  But Its Large Markets Were Low Valued "Black Fuel" Applications

- Gas-Fired CCGT Units Are Now Driving the Growth in Worldwide Gas Markets

BOTH PIPELINE AND LNG PROJECTS HAVE BEEN ABLE TO CAPITALIZE ON THIS GROWING DEMAND THROUGH COST REDUCTION

- For LNG, Increases in Train Sizes, Improved Equipment Design, Elimination of "Gold Plating" and Other Technical Improvements Have Brought About a Substantial Reduction in Costs Over the Past Decade

- But For Pipelines Improved Design Has Not Only Been Able to Reduce Costs, But Developments in Submarine Pipelining Have Made it Possible to Consider Options That Were Previously Not Technically Feasible

- This Has Made Pipelining Somewhat More Competitive With LNG Than It Might Have Been A Decade Ago

TWO MAJOR IMPROVEMENTS IN SUBMARINE PIPELINE DESIGN ARE DEEP WATER LINES AND HIGHER PRESSURE OPERATION

- Improved Pipelaying Techniques Have Made Deep Water Lines, Such as TransMed, Statpipe and Mahgreb, Technically Feasible

- The New Blue Stream Line Designed to Cross the Black Sea From Russia to Turkey Is Engineered for Depths of 2,150 Meters (7,050 Feet), Testing the Technical Frontier

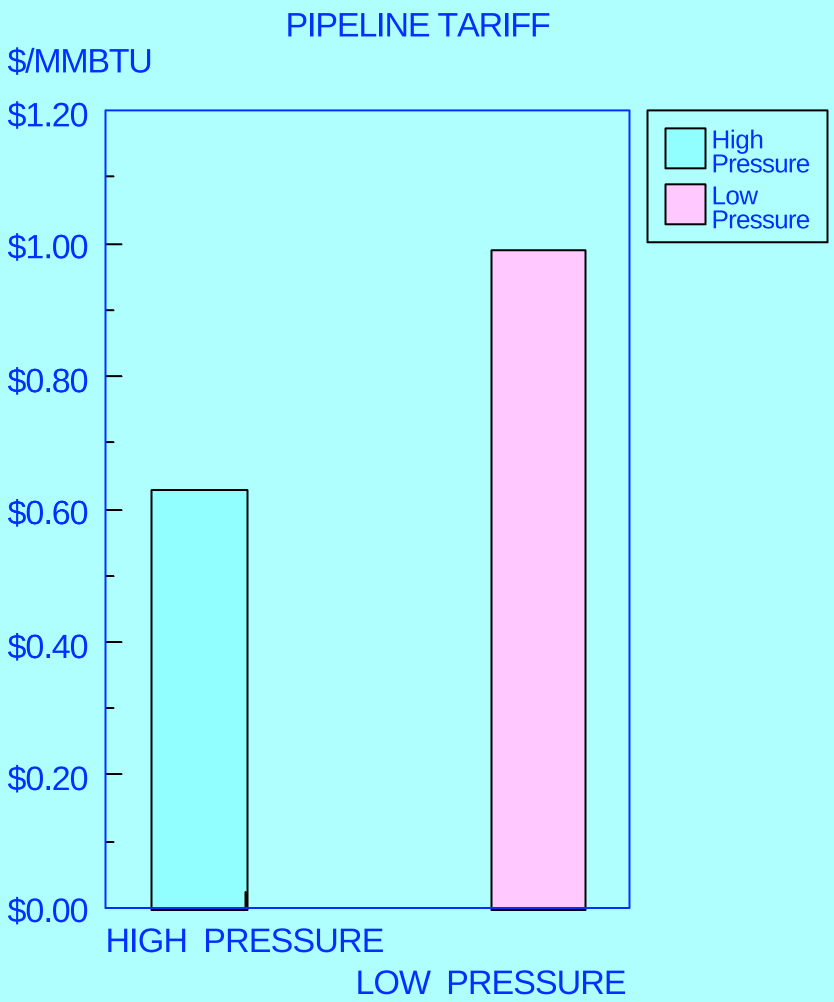
- Another Development is the Use of Much Higher Pressures For Submarine Lines Substantially Reducing the Need for Closely-Spaced - And Costly - Riser Platforms for Compressor Stations on Longer Lines

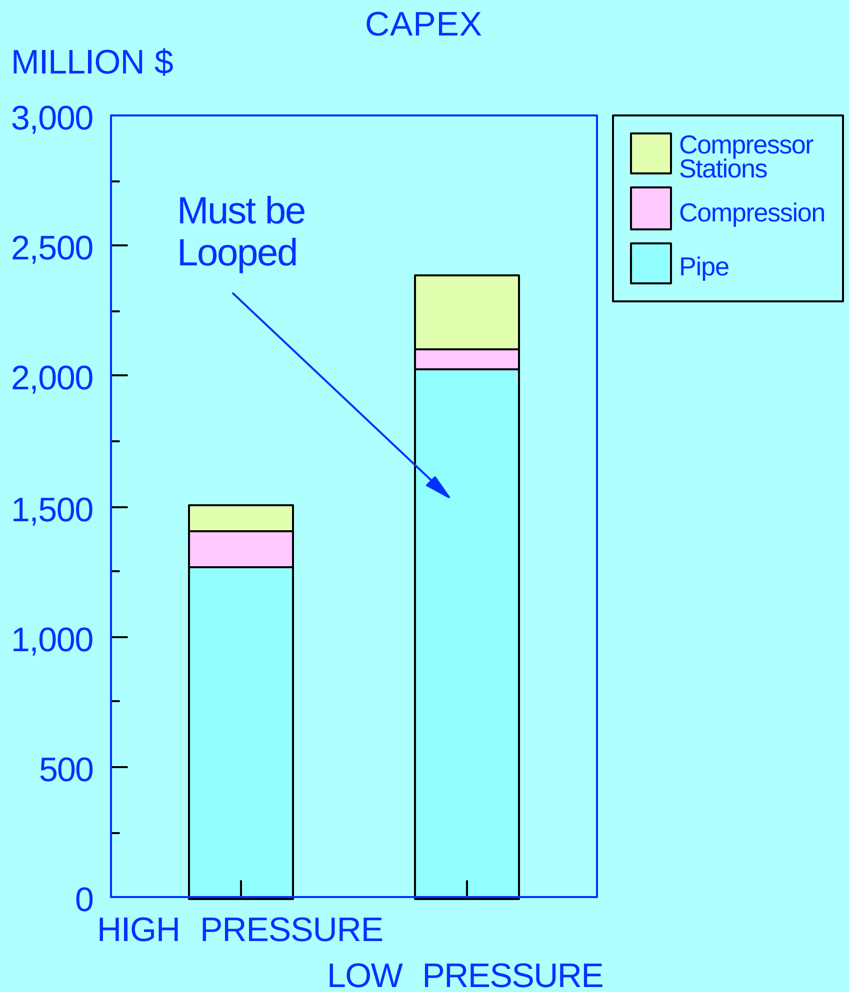
ILLUSTRATIVE SUBMARINE PIPELINING COSTS

NEWER HIGH PRESSURE LINE COMPARED TO OLDER LOW PRESSURE LINE WITH COMPRESSOR RISER PLATFORMS

850 KM LINE, 15 BCM CAPACITY

(APPROXIMATELY THE LENGTH OF THE FRANPIPE LINE IN THE NORTH SEA)





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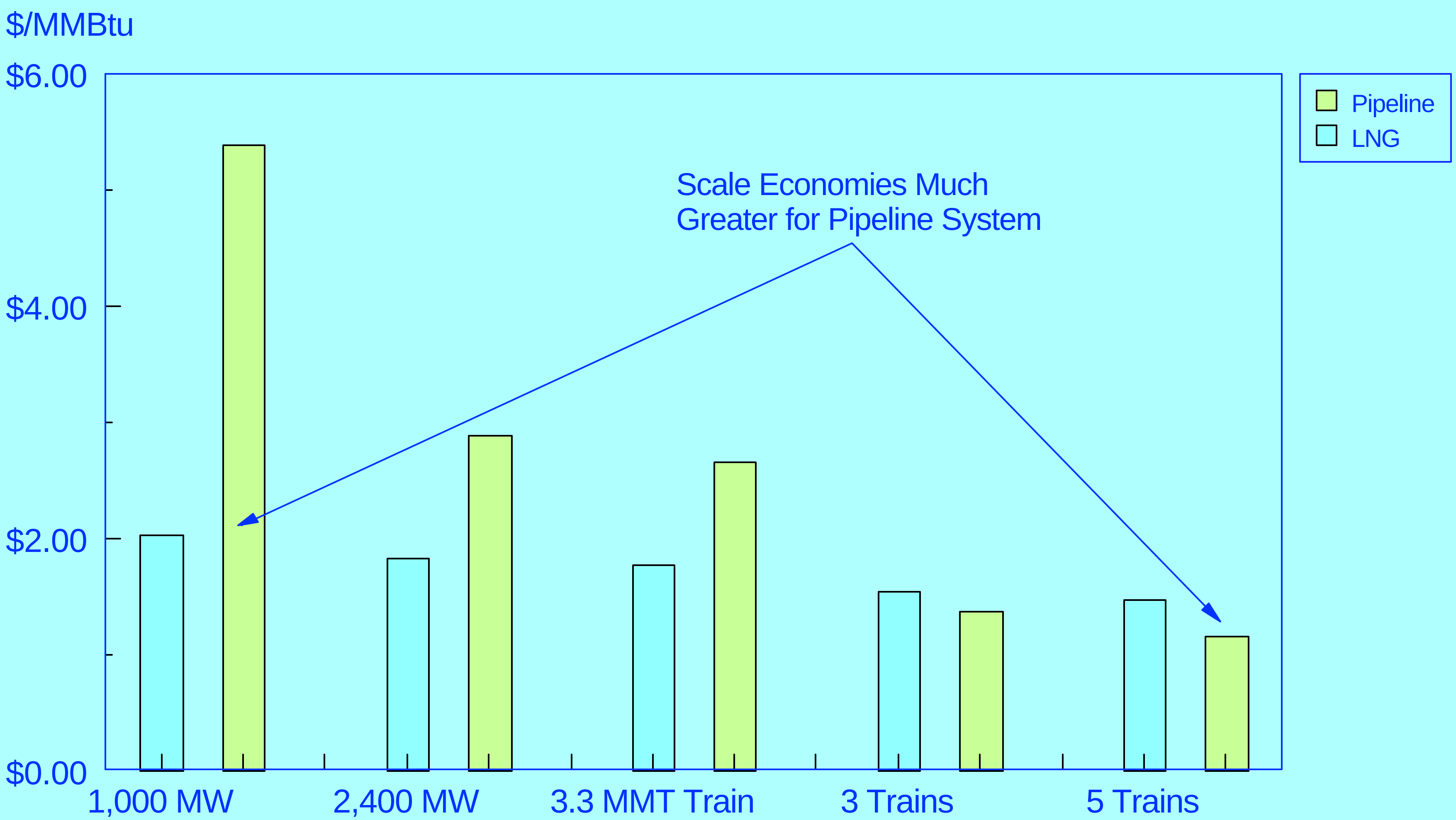
PIPELINES HAVE ALSO BENEFITTED SIGNIFICANTLY FROM THE GROWTH IN ENERGY MARKETS AND THE FOCUS ON LARGE POWER GENERATION CUSTOMERS

- Long Distance Pipelines Tend to Be More Sensitive to Economies of Scale Than Do LNG Projects
- Once an LNG Project is Large Enough to Justify an LNG Train, Further Economies Come Slower Than They Do For Pipelines
- For Smaller Projects Where the LNG Project Can Deliver to Several Smaller Terminals, Its Diseconomies May Not Be As Great as in Small Pipelines Delivering Over Any Distance

THE EFFECT OF MARKET SIZE ON THE RELATIVE COMPETITIVENESS OF LNG AND ONSHORE PIPELINING

ASSUMPTION - 2,500 KILOMETER HAUL



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Pipe and Terminal Sized to IPP Unit

One Train LNG Plant for Multiple Markets

Pipe Sized to Deliver Regas Volume

THE SIZE AND LOCATION OF MANY OF THE NEWER TARGET MARKETS WILL MAKE IT DIFFICULT TO DUPLICATE THE EXPERIENCES OF THE MAJOR GRIDS OR OF THE ASIAN LNG TRADE

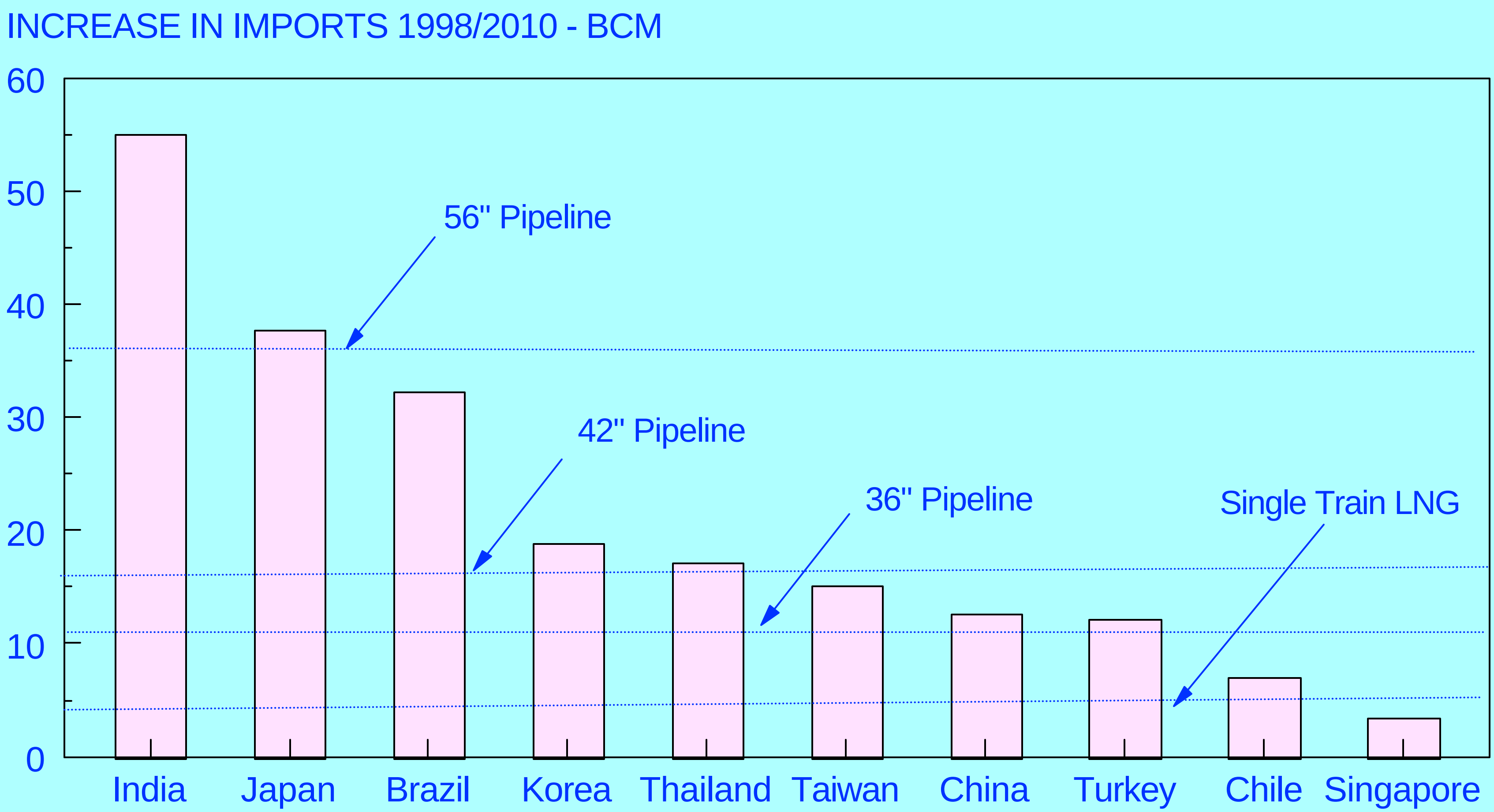
- The Newer Markets May Not Be Large Enough to Provide a Ready "Anchor" For Some of the "Worldscale" Supply Projects That Have Been Proposed For Them

- In Some Cases, Much of the Potential Demand Is in the Interior of the Country, Making it More Costly For LNG To Serve Than the Coastal Demand That Characterizes Japan, Korea and Taiwan

THE INTERNATIONAL "ANCHOR" MARKETS

ILLUSTRATIVE FORECAST [1] OF THE INCREASE IN GAS IMPORTS FOR COUNTRIES ISOLATED FROM THE THREE MAJOR GRIDS - 1998/2010

ESTIMATES BASED ON VARIOUS SOURCES [2]



[1] Excludes Argentina as an Exporter, Arab Gulf Local Trade

[2] JAI Estimates Based on EIA, APERC, Botas

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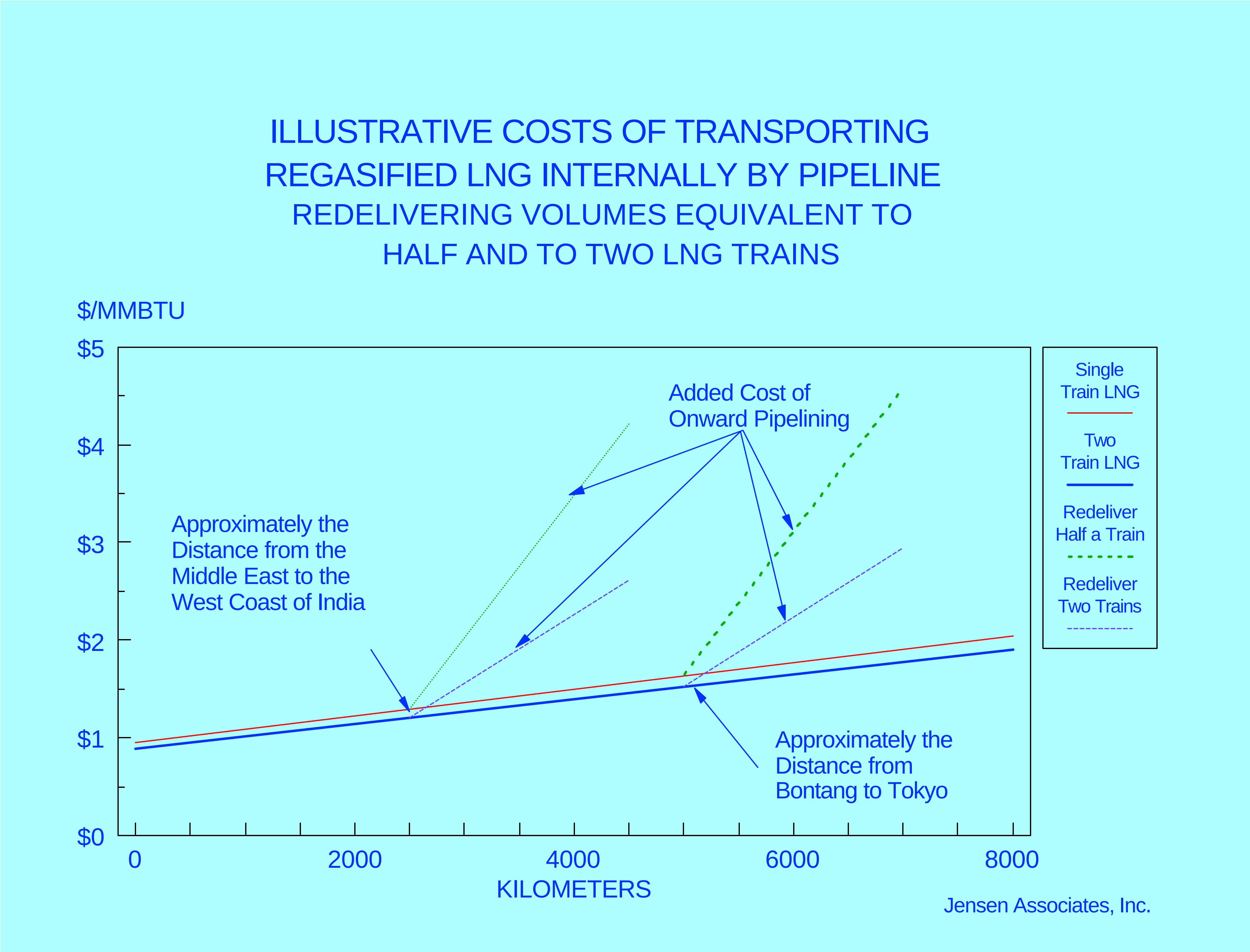

ILLUSTRATIVE COSTS OF TRANSPORTING
REGASIFIED LNG INTERNALLY BY PIPELINE
REDELIVERING VOLUMES EQUIVALENT TO
HALF AND TO TWO LNG TRAINS
$/MMBTU
$5
$4
$3
$2
$1
$0
0
2000
4000
6000
8000
KILOMETERS
Added Cost of Onward Pipelining
Approximately the Distance from the Middle East to the West Coast of India
Approximately the Distance from Bontang to Tokyo
Single Train LNG
Two Train LNG
Redeliver Half a Train
Redeliver Two Trains
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THE WORLD WIDE TREND TOWARDS ELECTRIC AND GAS INDUSTRY RESTRUCTURING MAY COMPLICATE THE DEVELOPMENT OF NEW PROJECTS

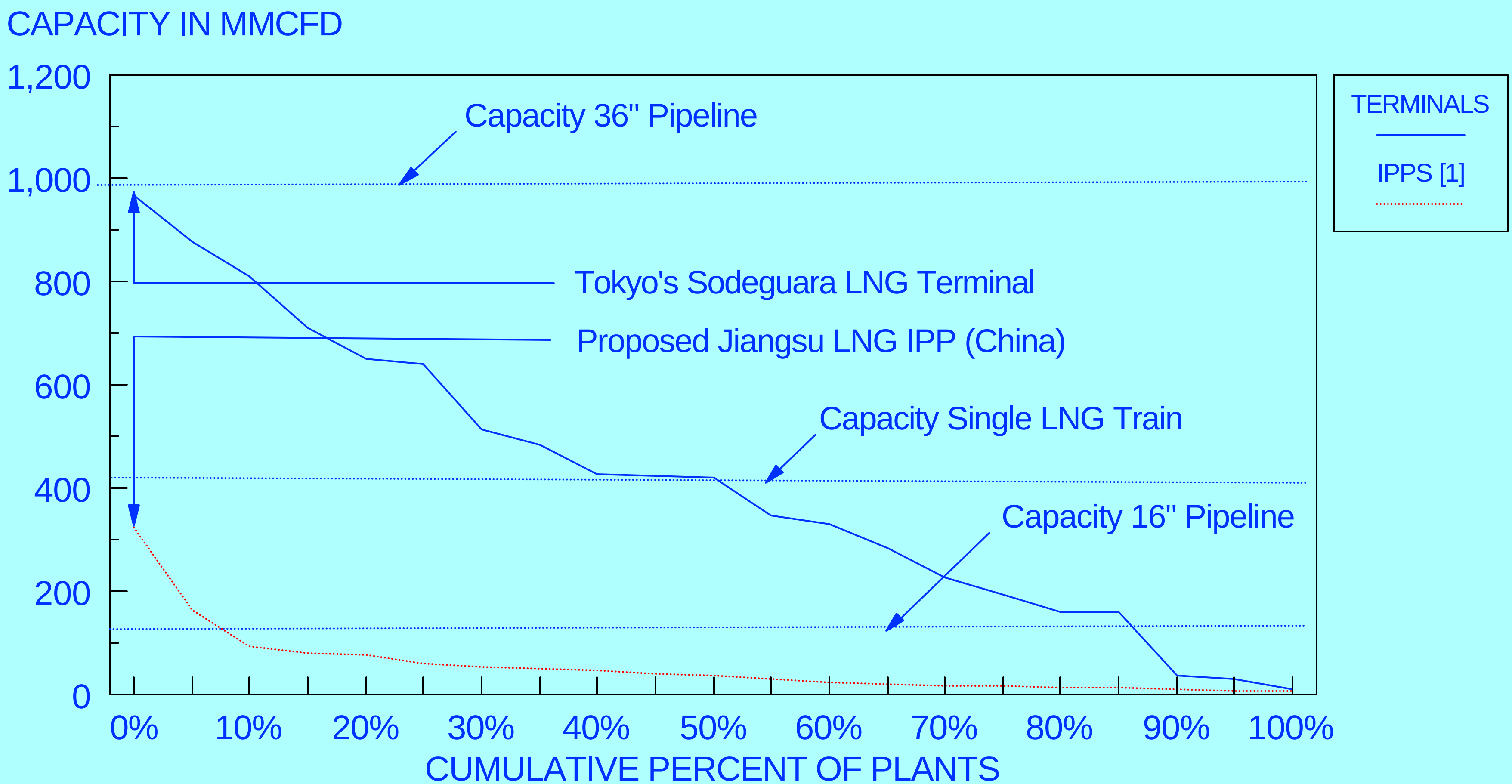
- The Trend Poses Special Problems in Customer Sizes and Thus in Project Scale, As Well as In the Efficient Utilization of Gas Delivery Capacity

- In Japan, Korea and Taiwan, LNG "Started at the Top" Since Some Of the Target Markets Were Among the Largest Coastal Electric Utilities in the World, Readily Providing the Scale Necessary for New Projects

- Many of the New Independent Power Projects Present Much Smaller Loads Than Those of Tokyo, Kansai or Chubu Electric That Contributed to Early LNG Demand
- These Smaller Terminals, If of Traditional Construction, Also Involve Much Higher Regasification Costs
- Technical Work Now Underway on Offshore and Floating Terminal Designs May Help to Alleviate This Problem

COMPARISON OF THE RELATIVE SIZE DISTRIBUTION OF THE WORLD'S LNG RECEIPT TERMINALS WITH THAT OF ASIAN [1] IPPS

EXPRESSED AS GAS CAPACITY [2]



[1] 44 IPPs Operating or Planned in Asia

[2] Assumes IPPs at 80% Load Factor, 50% Efficiency

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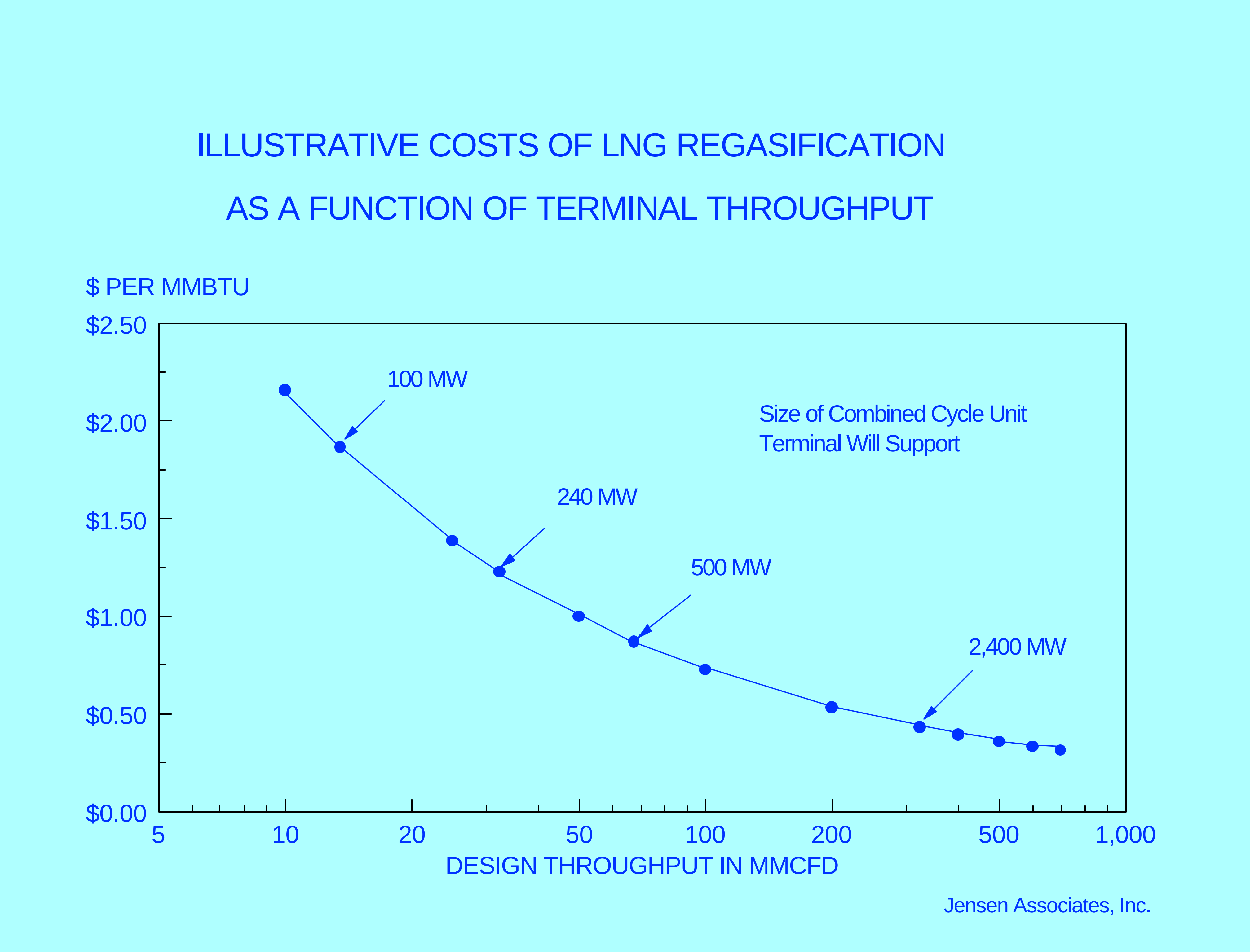
ILLUSTRATIVE COSTS OF LNG REGASIFICATION
AS A FUNCTION OF TERMINAL THROUGHPUT
$ PER MMBTU
$2.50
$2.00
$1.50
$1.00
$0.50
$0.00
100 MW
240 MW
500 MW
2,400 MW
Size of Combined Cycle Unit
Terminal Will Support
5
10
20
50
100
200
500
1,000
DESIGN THROUGHPUT IN MMCFD
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FOR POWER GENERATION, GAS-FIRED CCGT UNITS HAVE LOWER CAPITAL COSTS AND HIGHER THERMAL EFFICIENCIES THAN CONVENTIONAL STEAM BOILERS

- They Thus Permit the Trade Off of Higher Fuel Prices For Lower Capital Recovery Costs

- The Gas Netback From a CCGT Unit Is Substantially Better Than That From a Gas-Fired Steam Boiler

BUT THE ABILITY OF CCGT UNITS TO JUSTIFY HIGHER GAS PRICES IS BOTH A BLESSING AND A CURSE TO THE GAS INDUSTRY

- The Higher Prices That CCGT Units Permit May Be a Disadvantage When They Must Be Dispatched In Competition With Other Types of Generating Units

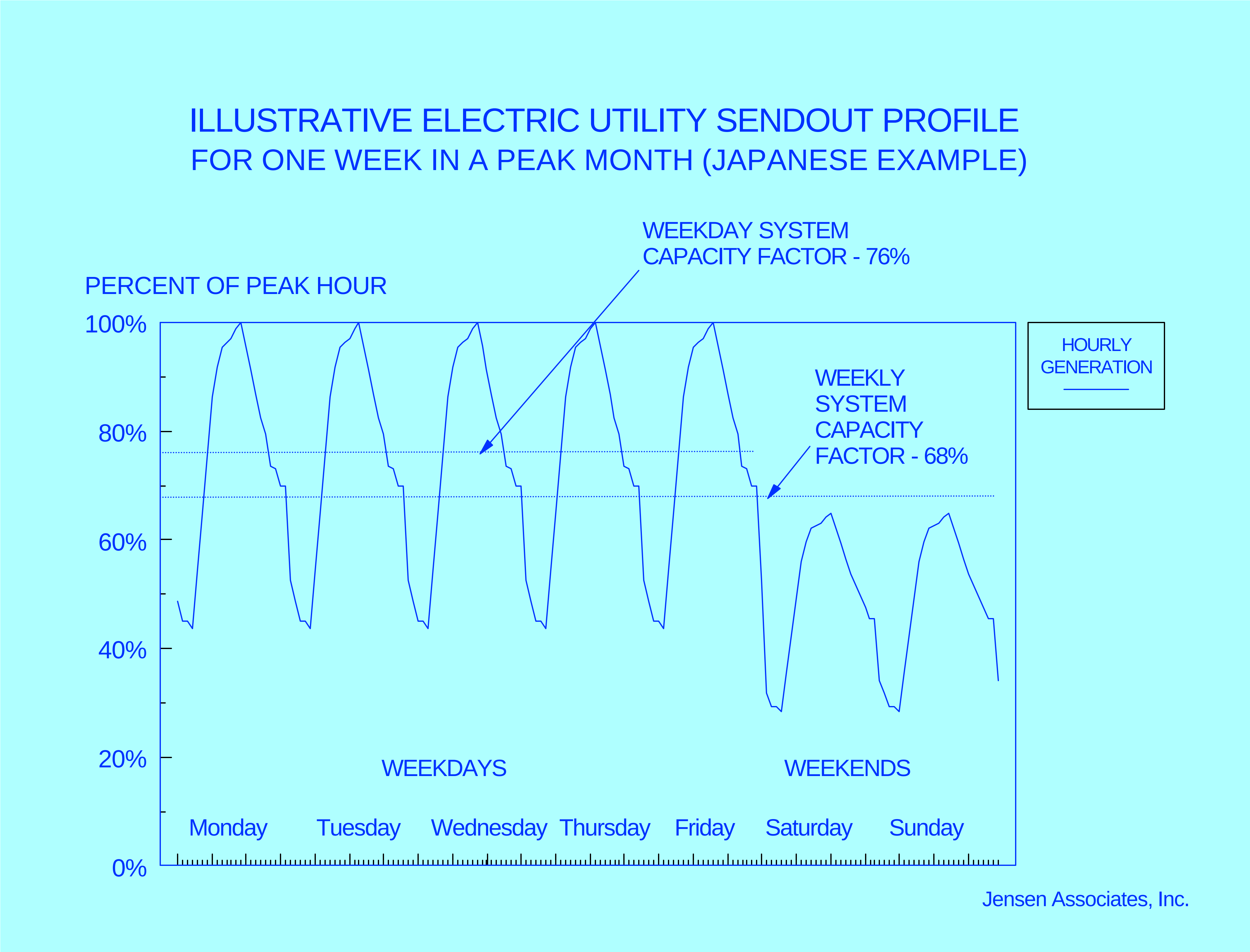
- The Higher Prices May Also Be a Disadvantage When Gas Competes in Traditional Residential, Commercial and Industrial Markets Where the "CCGT Premium" Does Not Operate

THE DAILY FLUCTUATION OF POWER GENERATION LOADS POSES A SPECIAL CHALLENGE FOR GAS SUPPLY PROJECTS

- Electricity Loads are Instantaneous, and Thus Electric Load Factors are Stated Against an Instantaneous Peak Demand in MW

- Electric Utility Sendout Varies Hourly, Weekly and Seasonally And is Very Important in Determining the Dispatch Order of Generating Units

- Since Electricity Generating Units Are Usually Dispatched on the Basis of Marginal Costs, the High Gas Prices That CCGT Units Permit May Prevent Their Being Dispatched as Base Load Units


ILLUSTRATIVE ELECTRIC UTILITY SENDOUT PROFILE
FOR ONE WEEK IN A PEAK MONTH (JAPANESE EXAMPLE)
WEEKDAY SYSTEM
CAPACITY FACTOR - 76%
PERCENT OF PEAK HOUR
100%
80%
60%
40%
20%
0%
HOURLY
GENERATION
WEEKLY
SYSTEM
CAPACITY
FACTOR - 68%
WEEKDAYS
WEEKENDS
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
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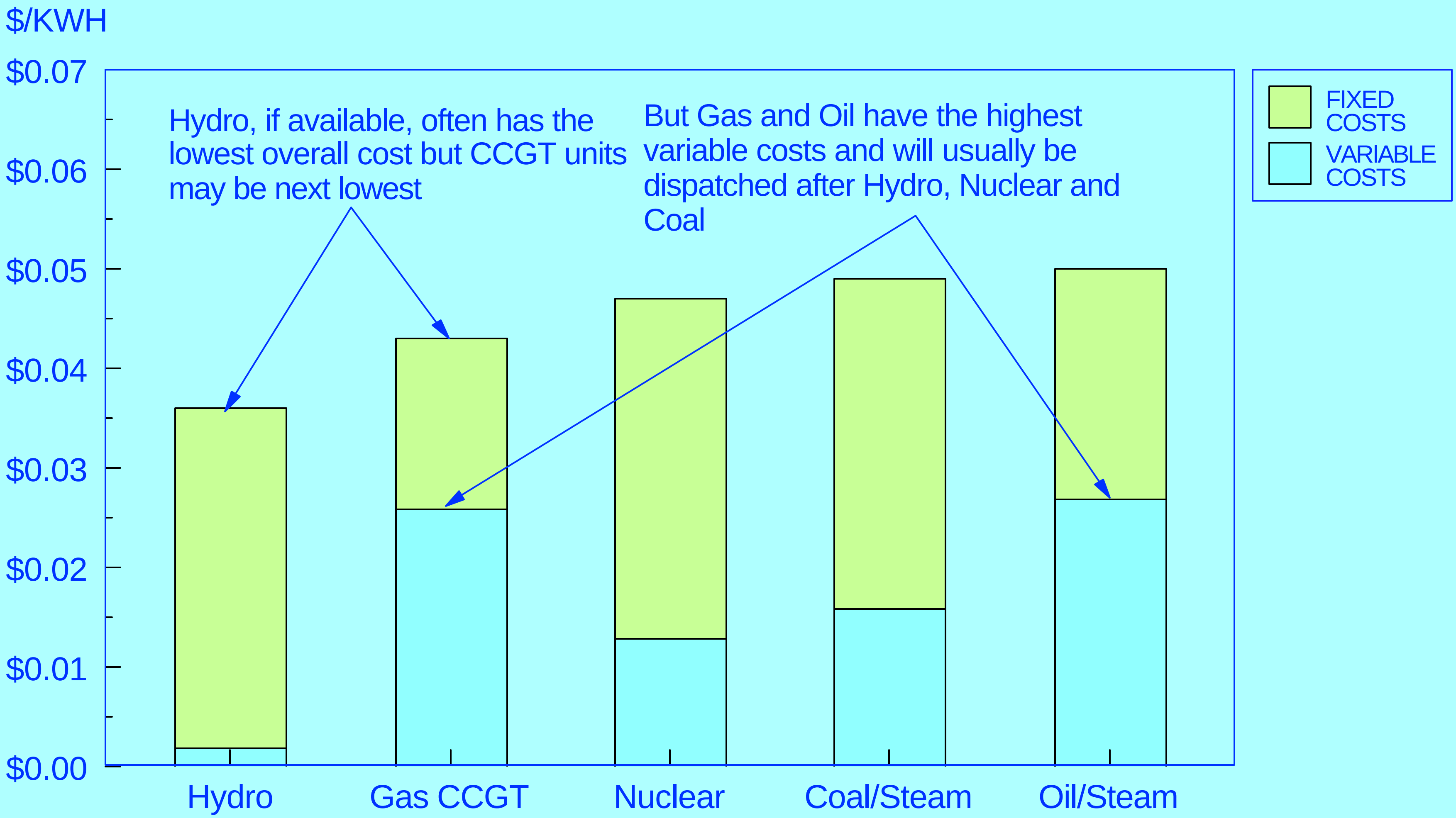
ILLUSTRATIVE POWER GENERATION COSTS BY UNIT TYPE

BASED ON JAPANESE 1999 IMPORTED FUEL COSTS

500 MW UNITS



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LNG HAS DEMONSTRATED ITS ABILITY TO DEAL WITH INTRADAY FLUCTUATIONS IN THE ASIAN POWER GENERATION MARKETS

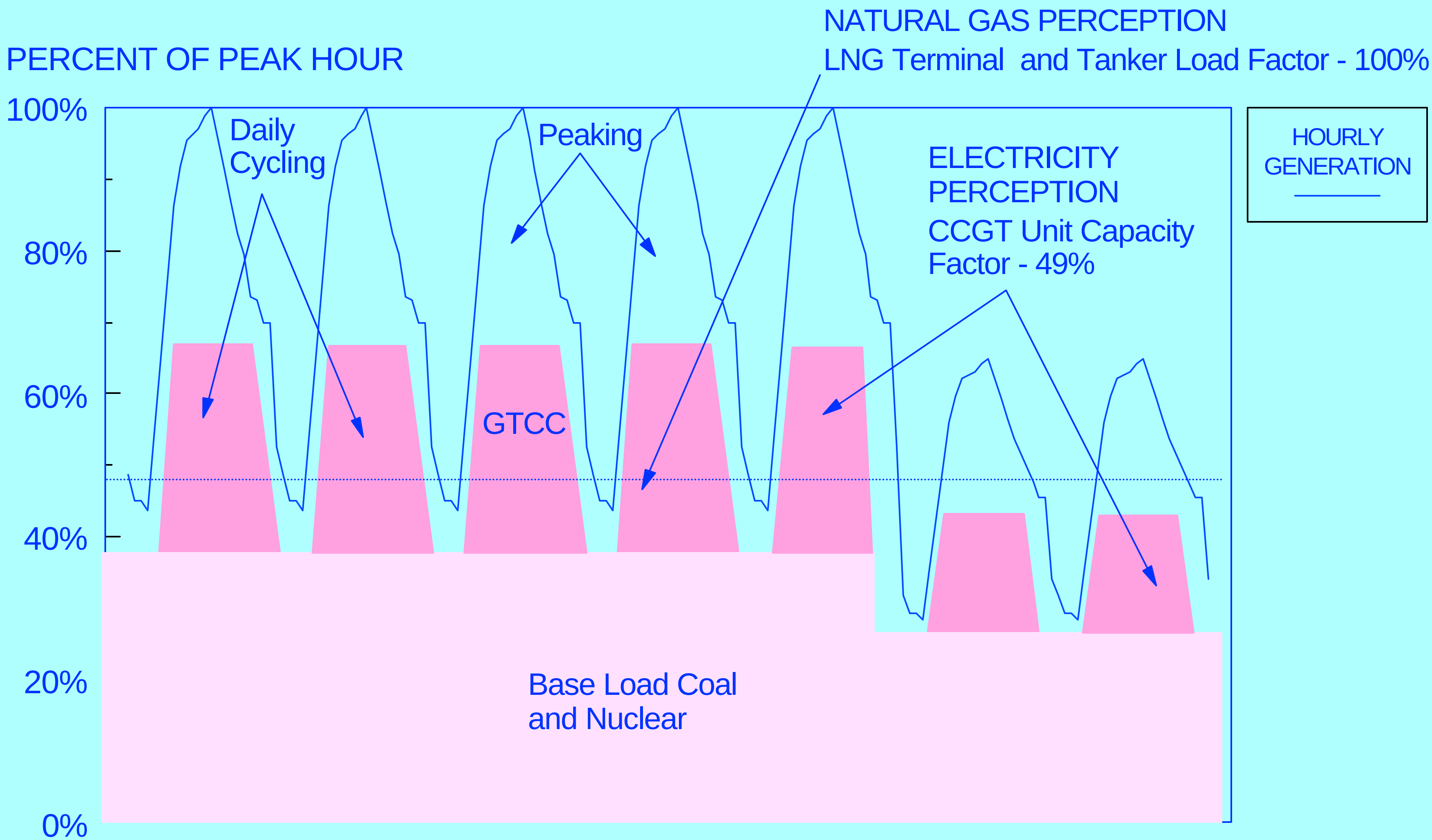
- It Thus May Have an Economic Advantage Over Pipelining Where It is Able to Deliver Directly From the Terminal to the Generating Units

- Effective Utilization Capacity of CCGT Units is Less Than 50% in Japan

- But Since the Capacity of Liquefaction, Tankers and Terminal Storage is Based on the Tanker Delivery Cycle, LNG Capacity (Except for the Low-CAPEX Gasifiers) is Relatively Insensitive to Load Fluctuations Between Deliveries And Can Be Essentially Base Loaded

TWO CONTRASTING PERCEPTIONS OF EQUIPMENT CAPACITY FACTORS OVER A ONE WEEK PERIOD

ASSUMING WEEKLY TANKER DELIVERIES



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PIPELINES, HOWEVER, HAVE TENDED TO OPERATE CAPACITY ON A DAILY BASIS (MILLIONS OF CUBIC FEET PER DAY)

- Pipelines Normally Utilize "Line Pack" to Handle Intra-Day Variations in Sendout

- The Pipelines Are Used to Providing Some Intra-Day Flexibility for Traditional Customer Loads, But Have Usually Limited the Peak Hour Delivery to Some Percentage of the Maximum Daily Quantity

- A Typical Pattern in the U.S., For Example, Limited Sendout in Any One Hour to a Maximum of 6% of the Daily Contract Quantity

- A Pipeline (With the 6% Limitation) Designed to Meet The Peak Hourly Requirement of a CCGT Unit With a 55% Daily Capacity Factor Would Operate at Only a 78% Pipeline Load Factor

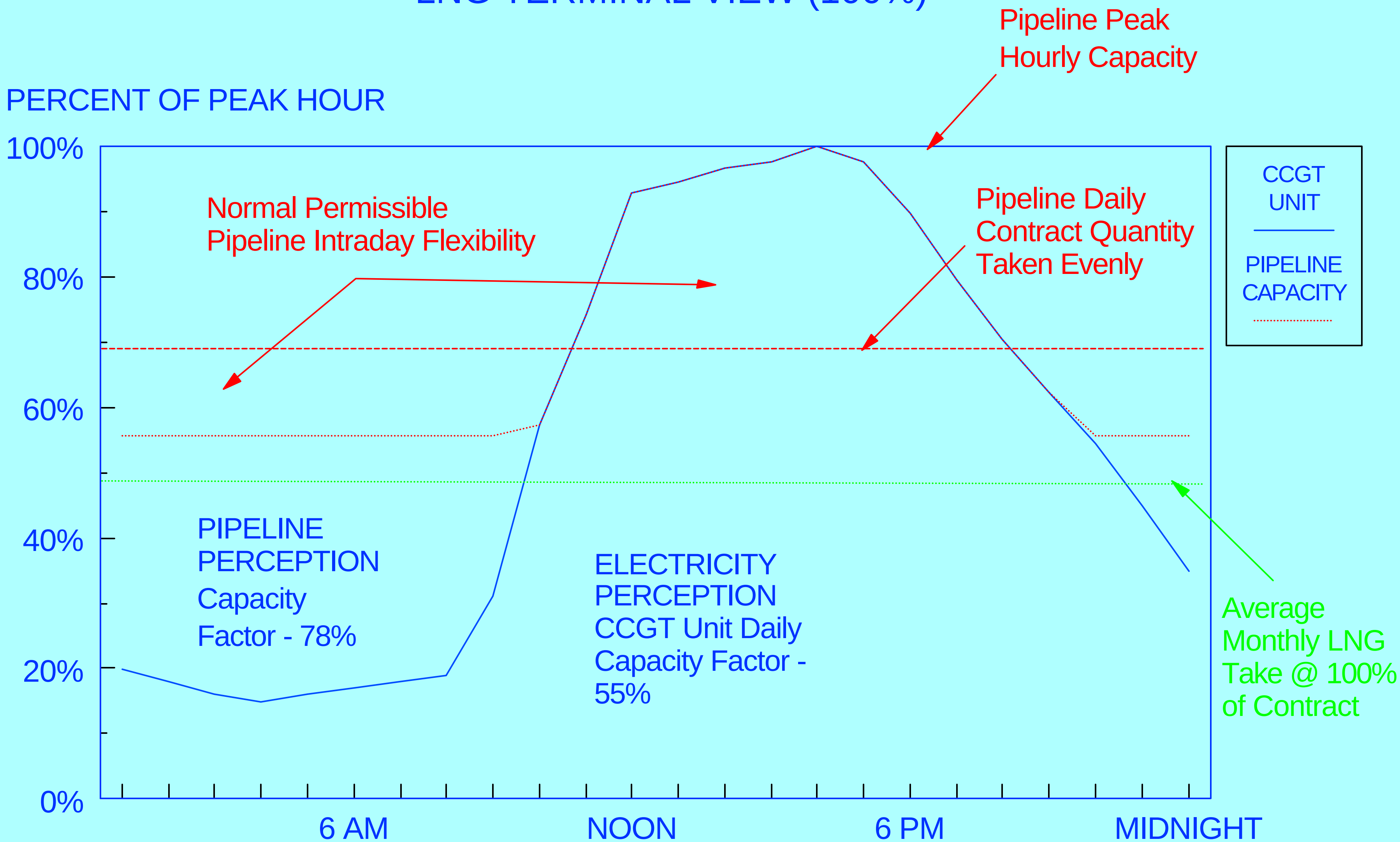
- This Represents Relatively Inefficient Utilization of Pipeline Capacity

- Newer Pipelines Designed for Gas-Fired Power Generation Loads May Operate at Elevated Pressures to Maximize "Line Pack"

- The Yacheng System (The World's Third Longest Offshore Gas Pipeline) That Serves Hong Kong from Offshore Hainan Island is an Example of Such a Design

DIFFERING PERCEPTIONS OF NATURAL GAS EQUIPMENT CAPACITY FACTORS DURING A SINGLE DAY

AN ELECTRICITY VIEW (55%) VERSUS A PIPELINER'S VIEW (78%) AND AN LNG TERMINAL VIEW (100%)



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WHILE THERE ARE NUMBER OF MARKETS WHERE PIPELINE AND LNG COMPETITION IS ACTIVE, FOUR OF THE MOST SIGNIFICANT ARE

- Turkey
- The Indian Subcontinent
- China
- Korea and Japan

EASTERN MEDITERRANEAN COMPETITION INVOLVES TWO MARKETS AND A NUMBER OF DIFFERENT SUPPLIER GROUPS

- While There Is Interest in Some Combination of Small, Politically-Complex Countries - Israel, Jordan, Lebanon and Syria - Turkey is the Major Target Market in the Region

- Russia, the Central Asian Republics, Iran, Egypt and Various LNG Suppliers Are Aggressively Competing to Supply Turkey

GAS IMPORT PROJECTS FOR THE EASTERN MEDITERRANEAN

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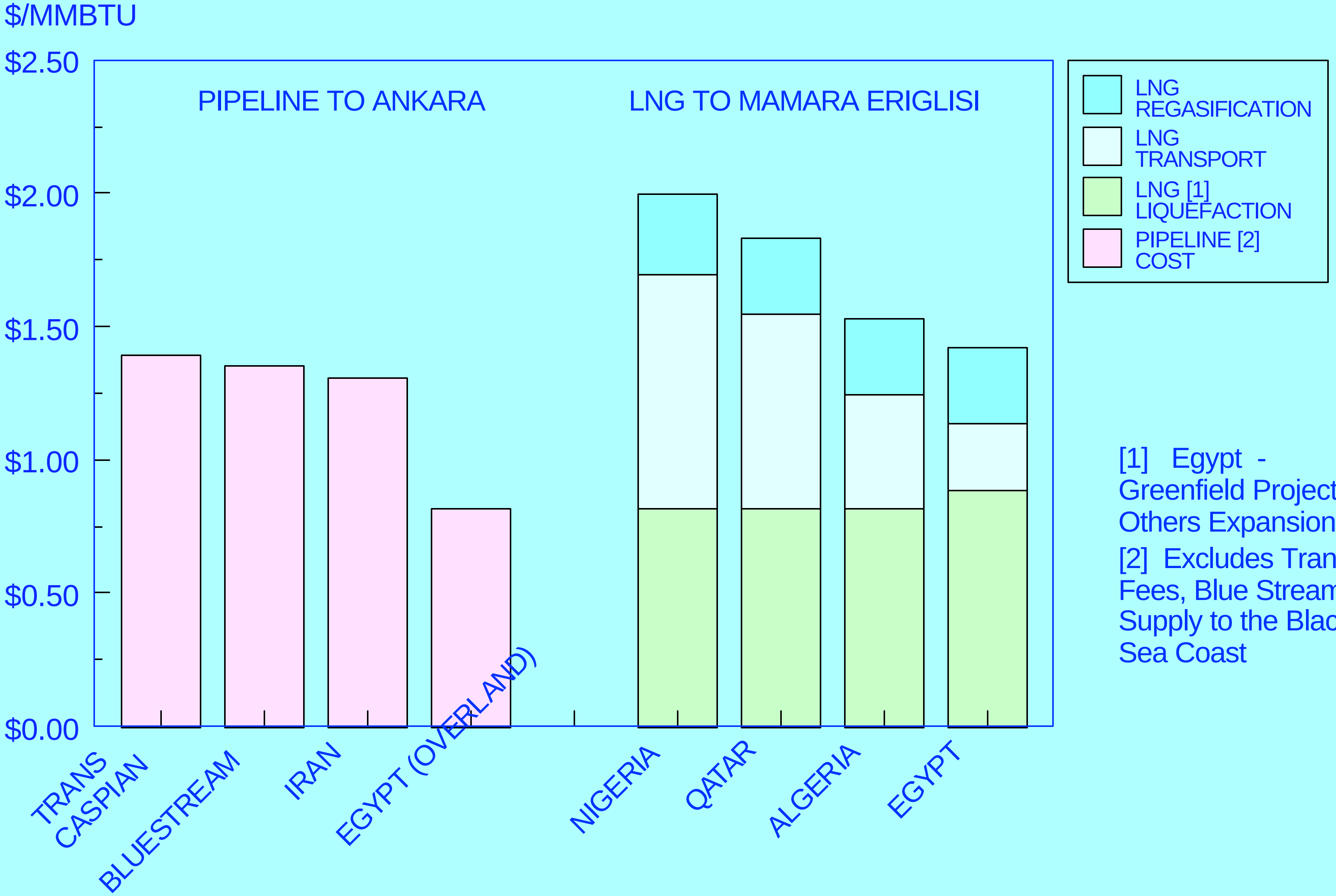
BASED ON "COOKBOOK" ECONOMIC CALCULATIONS, PIPELINE SUPPLY APPEARS TO PROVIDE CHEAPER TRANSPORTATION FOR TURKEY THAN LNG

- This Would Relegate LNG to a "Niche" or Supplemental Role in the Market
- This Appears to be What is Happening
- ("Cookbook" Calculations Are Hypothetical Comparisons of Projects Using Comparable Assumptions)

ILLUSTRATIVE "COOKBOOK" TRANSPORTATION COSTS FOR COMPETING SUPPLIES TO TURKEY

42" PIPELINES (16 BCM), 2 TRAIN LNG (7.9 BCM)

$/MMBTU



[1] Egypt - Greenfield Project, Others Expansions

[2] Excludes Transit Fees, Blue Stream Supply to the Black Sea Coast

UNTIL RECENTLY, THE TWO MAJOR NEW PIPELINE COMPETITORS FOR TURKEY'S MARKET HAVE BEEN

- Russia, Via the Technically-Innovative Blue Stream Line, a Deep Water Crossing of the Black Sea

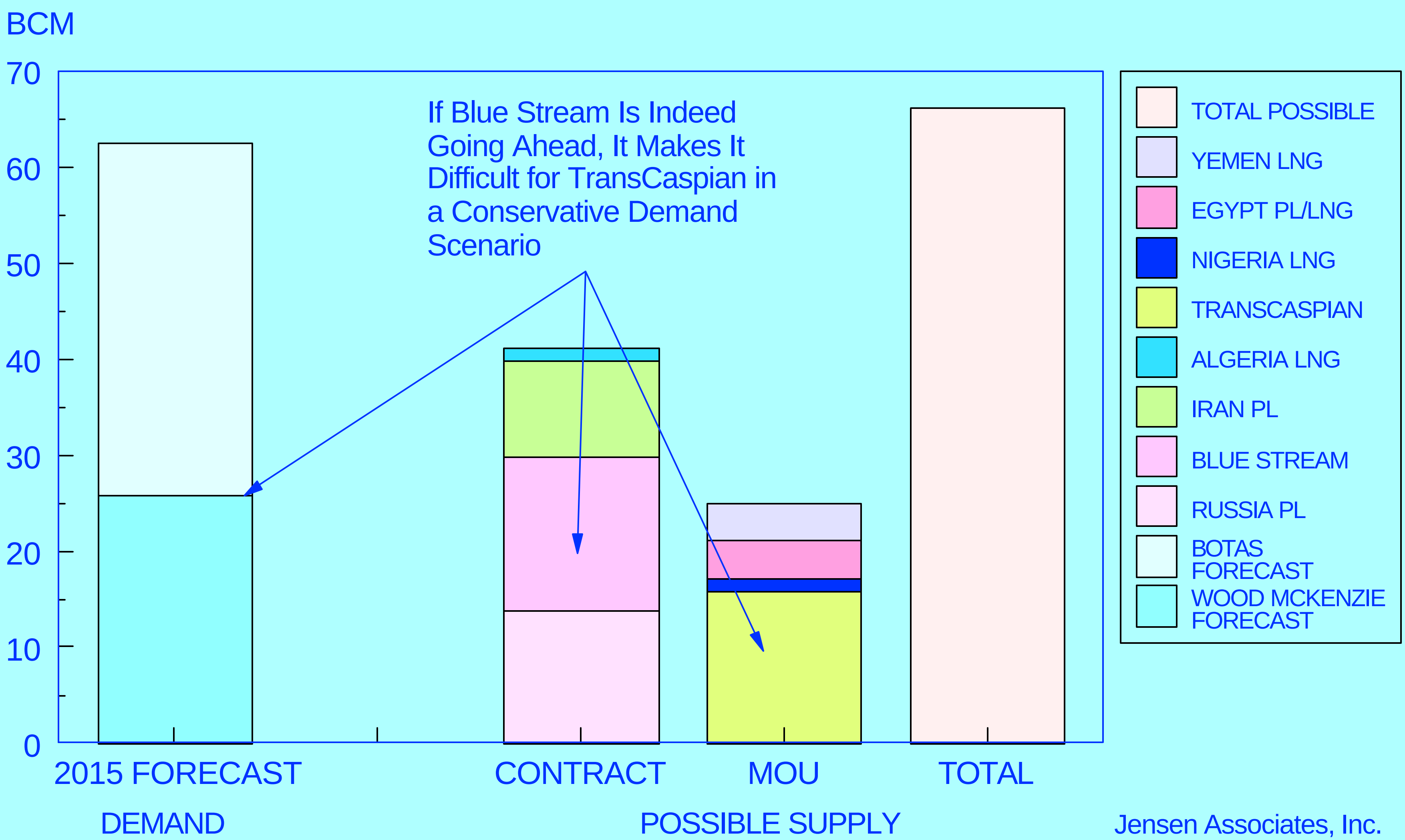
- And Turkmenistan/Azerbaijan Via the TransCaspian System

- Under Botas's Optimistic Estimates of Future Demand, There Is Room for Both Projects, But More Sceptical Outside Estimates Suggest That Blue Stream's Decision to Go Ahead Makes It Very Difficult For TransCaspian

- Indeed, the Sponsors of Turkmen Supply Via the TransCaspian Appear to be Dropping Out Leaving Azerbaijan's Giant Shakh Deniz Supply Still in the Race

COMPARISON OF VARIOUS SUPPLY COMMITMENTS FOR THE TURKISH MARKET WITH TWO DIFFERENT DEMAND FORECASTS

ESTIMATED DEMAND IN 2015 IN BCM



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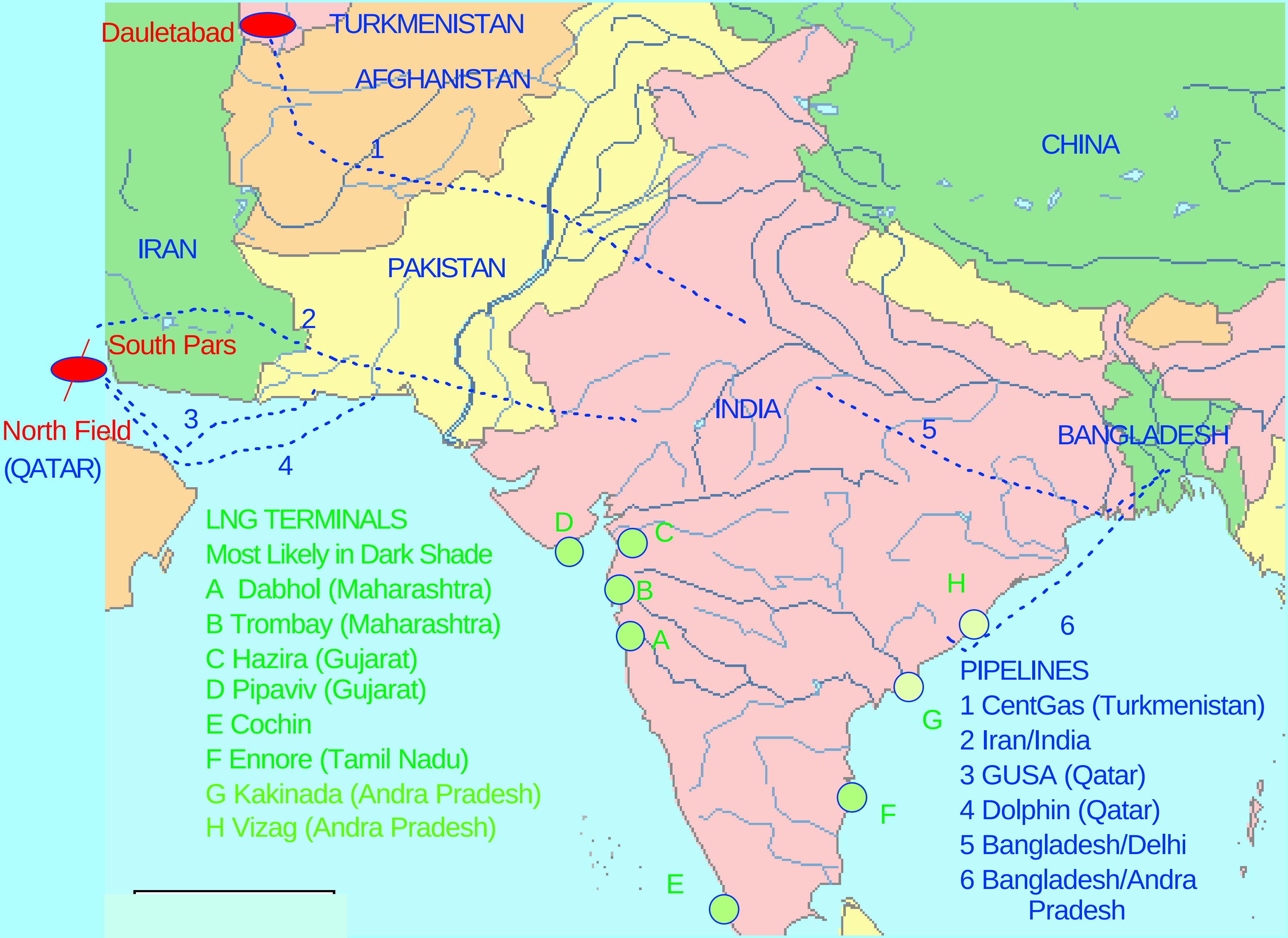
AS IT DOES IN TURKEY, PIPELINE GAS APPEARS TO HAVE A COST ADVANTAGE OVER LNG IN THE INDIAN SUBCONTINENT

- But the Pipeline Proposals Pose Political Risks
  - Pipelines From the West Require Pakistani Cooperation
  - Unocal Has Been Unable to Finance its CentGas System Transiting Afghanistan From Turkmenistan
  - Shell Appears to Have Lost Interest in Exporting Iranian Gas to India
  - While Qatar's GUSA Project to Pakistan Has Never Gotten Off the Ground, the Dolphin Project Is Still Trying Using Innovative Technology
  - Bangladesh Seems to Distrust a Project That Would Export to India

- As a Result, India Seems Committed to LNG Rather

GAS SUPPLIES FOR THE INDIAN SUBCONTINENT



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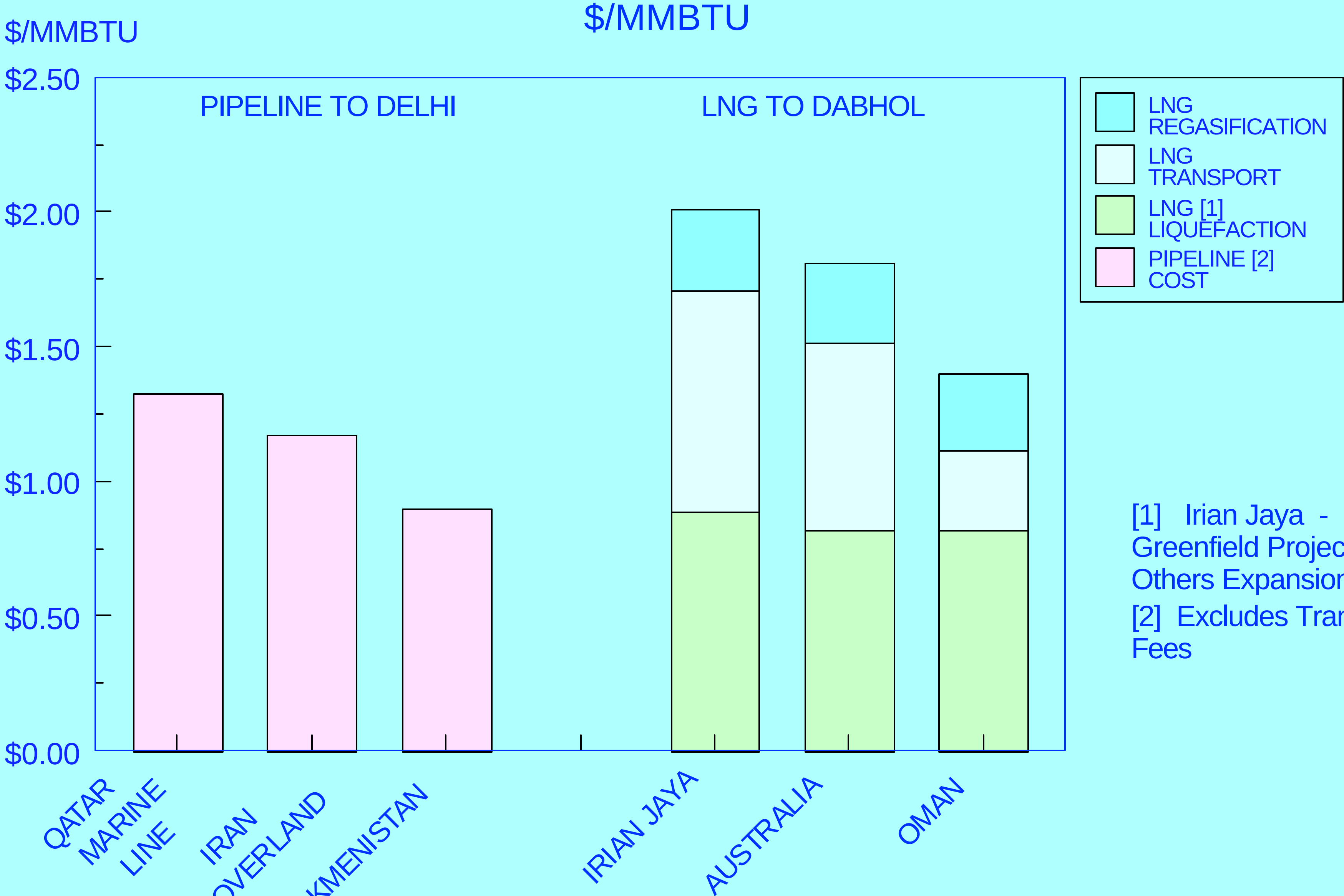
ILLUSTRATIVE "COOKBOOK" TRANSPORTATION COSTS FOR COMPETING SUPPLIES TO INDIA

48" PIPELINES (20 BCM), 2 TRAIN LNG (7.9 BCM)

$/MMBTU



[1] Irian Jaya - Greenfield Project, Others Expansions

[2] Excludes Transit Fees

THE MOST AMBITIOUS GROUP OF INTERNATIONAL PIPELINE PROPOSALS EMANATE FROM THE NORTHEAST ASIAN NATURAL GAS PIPELINE GROUP

- While China is the Centerpiece of These Plans, Both Korea and Japan Are Interested in Pipeline Supply to Create Competition for What They View as Overly Rigid Contracting Practises by LNG Suppliers

- Korea Is Considering Pipeline Supply From Irkutsk in Eastern Siberia Via China on the Assumption that China Will Import From Russia

- Japan Could Also "Piggyback" on the Same System or it Could Import Directly From Sakhalin

THE NORTHEAST ASIA "GRAND DESIGN"

ALL FORECASTS OF CHINESE GAS DEMAND FORESEE SOME RELIANCE ON IMPORTS

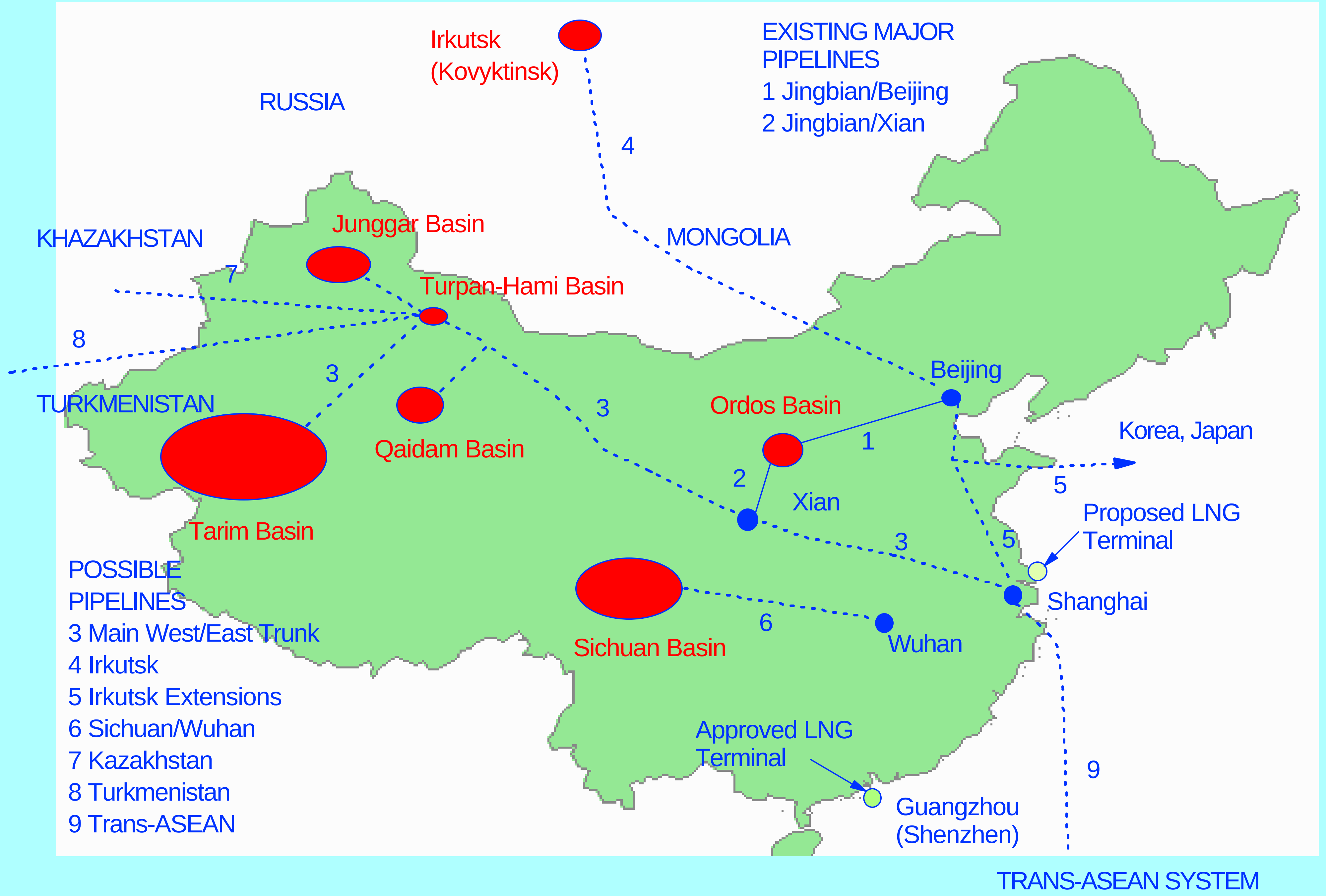
- Chinese Domestic Gas Resources Are Scattered, the Largest of Which are In the Tarim, Sichuan and Ordos Basins

- Beijing and the Northeast Are the Logical Markets for Ordos, While the Central South Region Around Wuhan is Sichuan's Natural Market

- The Largest Reserves, Including the Tarim Basin, Are in the West at a Great Distance from the Major Unsatisfied Market Demand Around Shanghai

- Hence, Chinese Efforts to Develop Domestic Supply Require a Very Large West-to-East Trunkline System

CHINESE GAS SUPPLY OPTIONS



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A RECENT ASIA PACIFIC ENERGY RESEARCH CENTRE STUDY OF NORTHEAST ASIAN GAS MARKETS PROVIDES COST COMPARISONS OF CHINESE SUPPLY OPTIONS

- In China, Direct Comparisons of Chinese Transportation Economics Are Difficult Since Alternative Supplies Vary in Size, Serve Different Regions and May Prempt Other Options

- The APERC Study Dealt With This Problem by Creating Scenarios With Different Supply "Menus" at Two Levels Of Future Demand

- Each Supply/Demand Scenario Emphasized A Particular Supply Option, Balancing Out the the Supply "Menu" From Other Available Sources

- From "Cookbook" Calculations (Provided by JAI), It Was Possible to Estimate Both the Transportation Cost of the Selected Option as Well as Its Effect on the Overall Transportation Costs of Supply

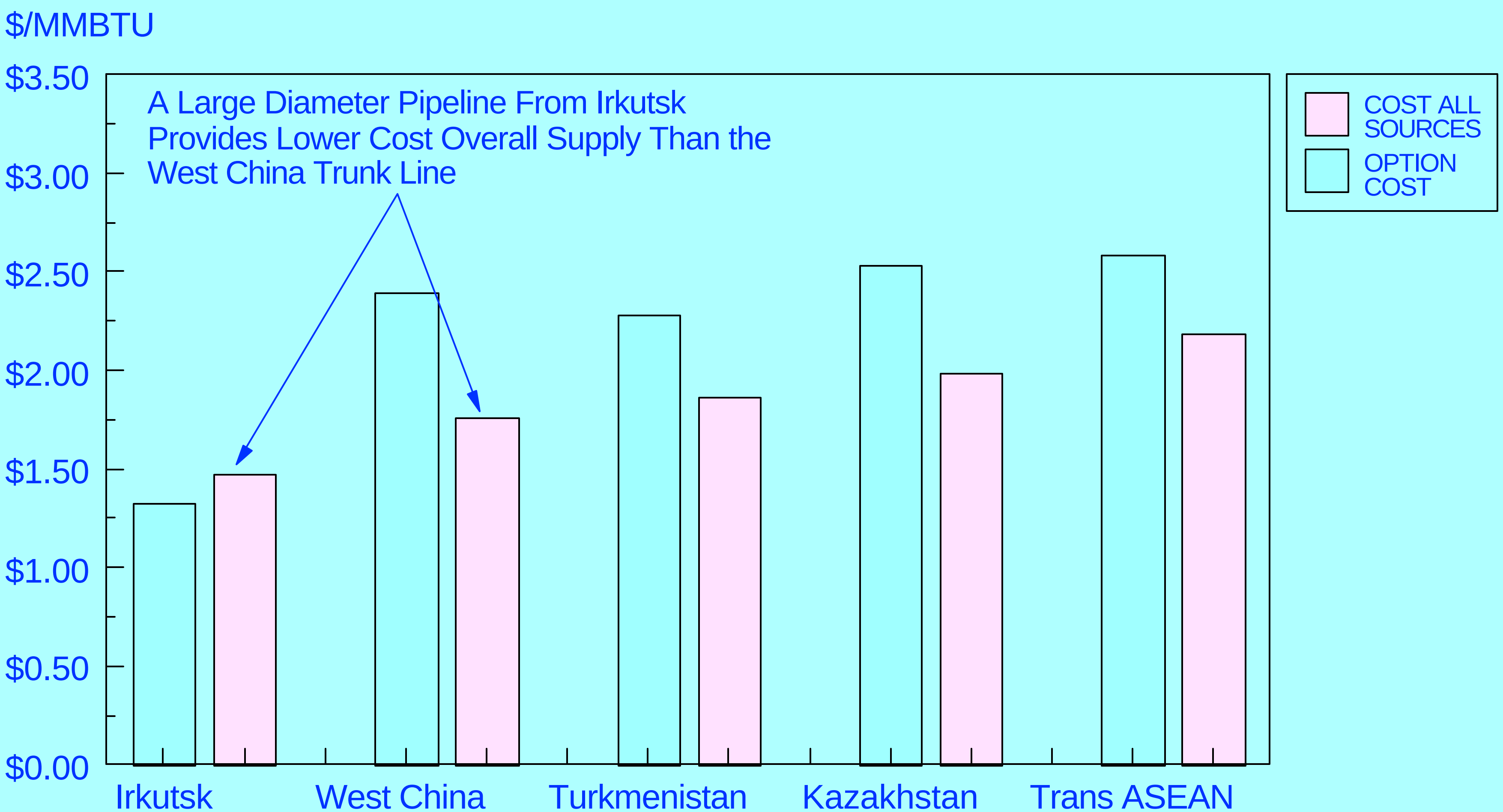
SOME OF THE PRINCIPAL FINDINGS OF THE ANALYSIS WERE

- The Great Distances Between the Major Coastal Markets and the Principal Sources Of Supply Argue for Very Large Pipelines to Keep Costs Down
- Thus the West China Trunk Line, Like the Major Import Projects, May Require Investments of $7 Billion or More
- APERC's Demand Projections For China Make it Difficult to Consider More Than One Major Project in the Next Decade
- Imported Supply from Irkutsk is Less Costly To China Than Domestic Supply From the West Via the Trunk Line

TRANSPORTATION COSTS [1] FOR DELIVERING THE MAJOR REMOTE SUPPLY SOURCES TO CHINESE MARKETS

TRANSPORTATION COST OF OPTION AND OVERALL TRANSPORTATION COSTS OF ALL SOURCES TO CHINA

LARGE DEMAND SCENARIOS - $/MMBTU



[1] Based on APERC Study

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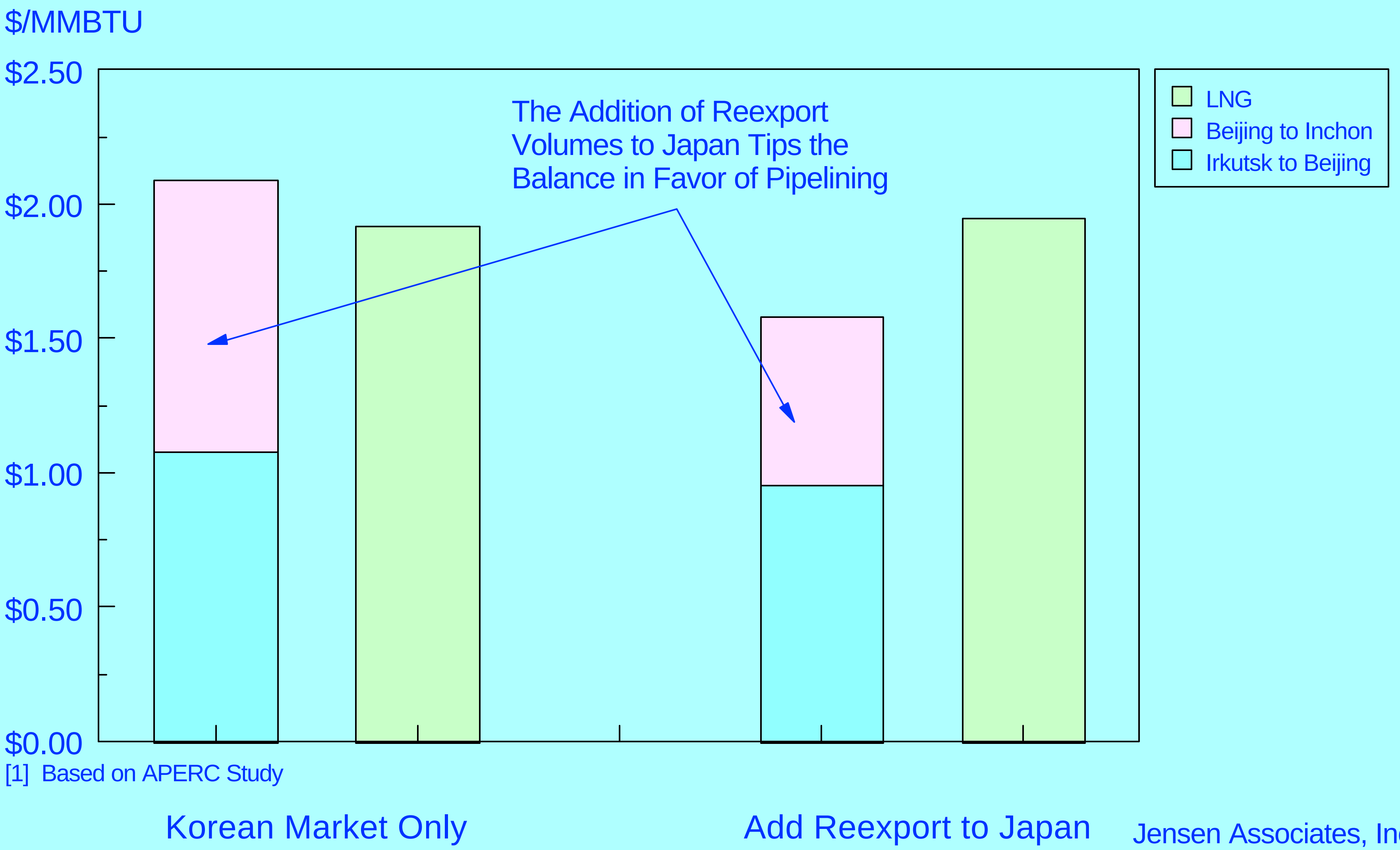
- While LNG from Asia Pacific Sources Provides Lower Cost Transportation For the Shanghai Region Than the West China Trunk, Preserving That Market for West China Has Substantial Pipeline Scale Economy Benefits to China as a Whole if the Pipeline is to Be Built
- It Would Be Difficult for Korea, On Its Own, to Provide a Large Enough Market to Justify an Extension of the Irkutsk Line Across the Yellow Sea
- While the Added Volumes Through Reexport to Japan Would Make Pipeline Supply to Korea More Attractive, Japan Would Have to Build a National Grid at High Cost to Accomodate Them

TRANSPORTATION COSTS [1] OF GAS TO KOREA
LNG VERSUS REEXPORTS FROM CHINA
$/MMBTU



[1] Based on APERC Study

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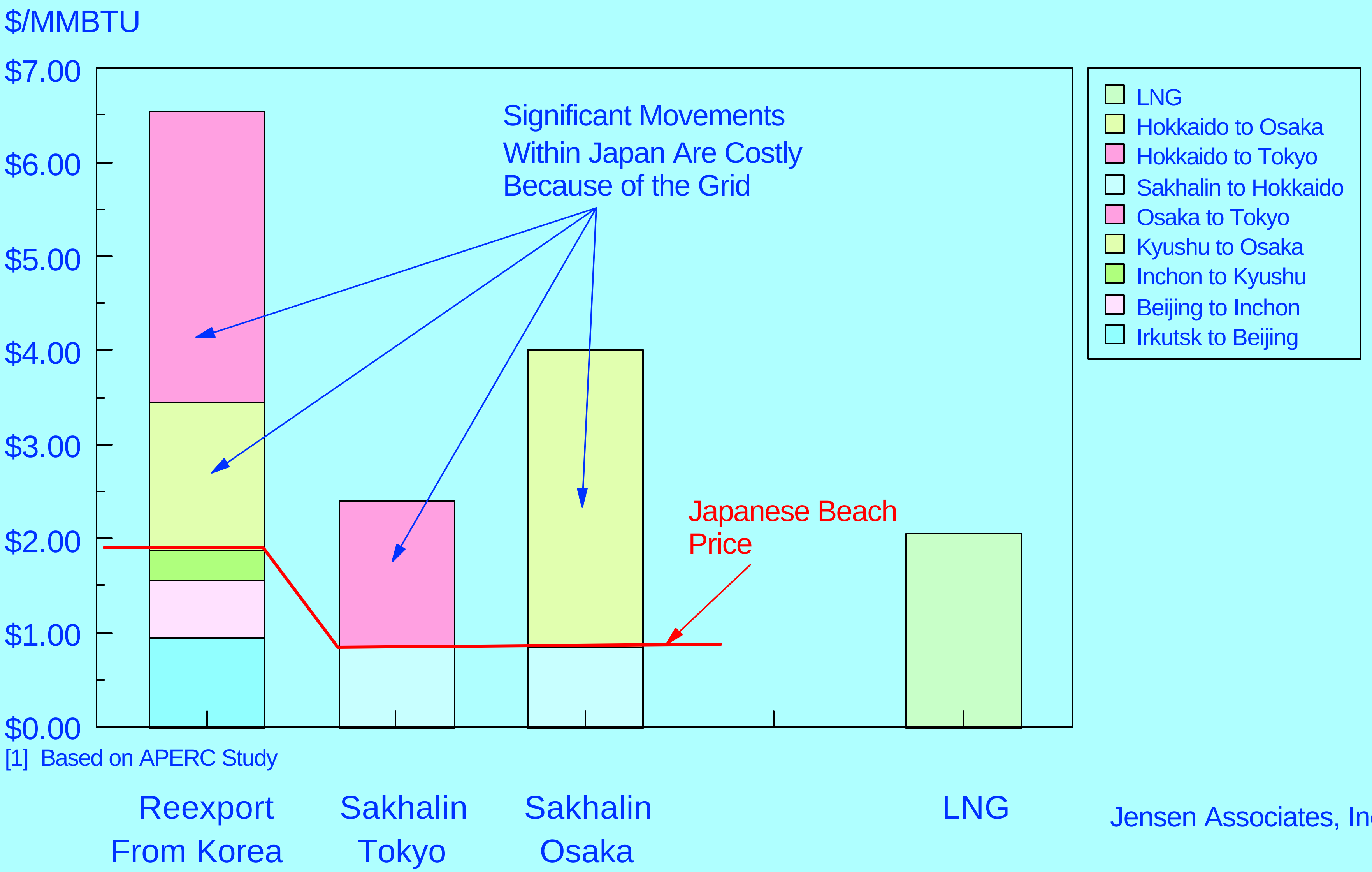
- The Very High Costs of Pipeline Construction in Onshore Japan (More Than Five Times Those of Typical Costs Elsewhere) Make the Proposed Japanese Gas Grid Extremely Costly and Argue for Putting As Much of It Offshore As Possible
- The Desire to Extend the Grid Throughout the Country Compounds the Cost Problem Since the Smaller Decentralized Deliveries Suffer Diseconomies of Scale
- A Simpler Japanese Pipeline Solution, Which is Now Being Studied, Would Concentrate on Delivering Gas From Sakhalin to the Kanto (Tokyo) Region and Not Attempt the Full Grid System

TRANSPORTATION COSTS [1] OF GAS TO JAPAN ASSUMING CONSTRUCTION OF A COMPLETE JAPANESE GRID SYSTEM LNG VERSUS SAKHALIN AND REEXPORTS FROM CHINA VIA KOREA

$/MMBTU

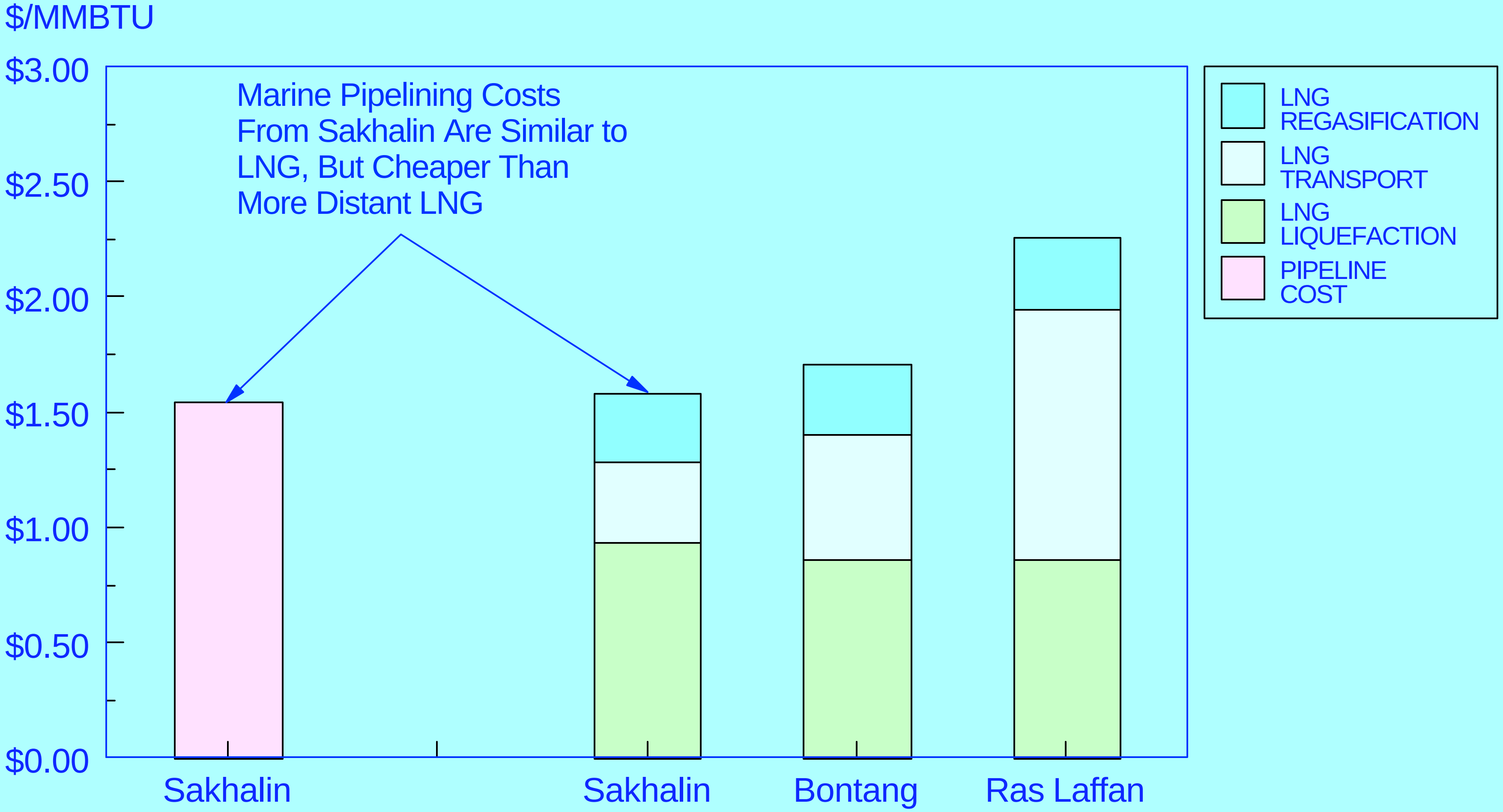


[1] Based on APERC Study

Jensen Associates, Inc.

ILLUSTRATIVE "COOKBOOK" TRANSPORTATION COSTS [1] FOR COMPETING SUPPLIES TO KANTO (TOKYO) REGION ASSUMING A PACIFIC SUBMARINE LINE AND NO FULL SCALE GRID

$/MMBTU



[1] Option not included in APERC Report

SOME OBSERVATIONS

- Competition Between Pipelines and LNG is Here to Stay
- They Need Not Necessarily Be Rivals Since There Can Be Positive Interactions Between the Two
- The Choice Between The Two Supplies Will Be Influenced Not Only By Economics But by Domestic Policy and Political Risk Considerations, as Well
- As International Trade Grows and Gas Markets Become More Complex, LNG or Pipeline Project Sponsors Who Fully Understand the Advantages and Disadvantages of Each in Their Target Markets Will Have the Best Chance for Success