LNG Marine Import Terminals

Joint Subcommittee Studying Manufacturing Needs and the Future of Manufacturing in Virginia Pursuant to SJR 361

Paul E. Ruppert - Vice Pres.
Pipeline Engineering &
Plant Operations

Dominion

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LNG Marine Import Terminals

- Criteria for siting an LNG Marine Import Terminal
- LNG Marine Import Terminal Sites Pending
- Existing LNG Assets and Potential in Virginia

LNG: A Safe Form of Energy

- Nontoxic, odorless, non-explosive, non-flammable in liquid state.
- Safely transported in more than 33,000 voyages since 1959.
- Hauled by robust, double-hulled vessels designed for safety.

LNG Marine Import Terminals

Siting Considerations

- Relatively Deep Water (at least 40 feet of depth)

LNG Marine Import Terminals

Siting Considerations

- Tanker Access
  - Bridges
  - Channel Width
  - Ship Traffic Restrictions
    - Night-time transit restriction
    - Fog/wind/weather
    - Coordination of transit with docking pilots, etc.
    - Frequency and proximity of other vessel traffic

LNG Marine Import Terminals

Siting Considerations

- Significant Acreage Required (total land at Cove Point – 1,017 acres; only 108 acres developed)

  - Security

  - Safety

  - Regulations

LNG Marine Import Terminals

Siting Considerations

- Proximity to Transmission Pipeline Grid

  - Existing pipeline systems link supply to market

  - Significant “take away” capacity required

  - Gas Quality Interchangeability

LNG Marine Import Terminals

Siting Considerations

- Public and Local/State Government Acceptance
  - Perceived safety and security issues
  - NIMBY issues
  - Environmental issues

LNG Marine Import Terminals

Proper Siting and Facility Layout correlates to being a good neighbor and probability of success

Cove Point Terminal is a Good Example

- Open Shipping Channel
- Close Proximity to Transmission Pipeline Grid
- Pier remote to Terminal and Public
- Adequate property for Safety and Security
- Environmental Partner – Member of Cove Point Natural Heritage Trust
- Gas Quality issues addressed prior to LNG import service

Typical LNG Terminal Permits - Federal

- Twelve or more permits, licenses, authorizations or clearances required from a variety of administrative agencies

Homeland Security

U.S. COAST GUARD

Federal Energy Regulatory Commission

U.S. Fish & Wildlife Service
Conserving the Nature of America

US Army Corps of Engineers®

NOAA FISHERIES SERVICE

Typical LNG Terminal Permits - State

- Fifteen or more permits, licenses, authorizations or clearances required from a variety of administrative agencies

Commonwealth of Virginia
DEQ Virginia Department of Environmental Quality

Virginia Department of Conservation & Recreation

VIRGINIA
SIC SEMPER TYRANNIS

Virginia Department of Game & Inland Fisheries

VIRGINIA MARINE RESOURCES COMMISSION
Marine Resources Commission

Typical LNG Terminal Permits - Local

Permits, Licenses, Authorizations & Clearances
LOCAL:
Forest Conservation Plan
Site Plan Approval
Grading Permit
Erosion & Sedimentation Control Plan
Building Permit
Stormwater Management Plan
Wetland Permit
Local Waterway Preservation Review Committee Permit (City Planning Department)

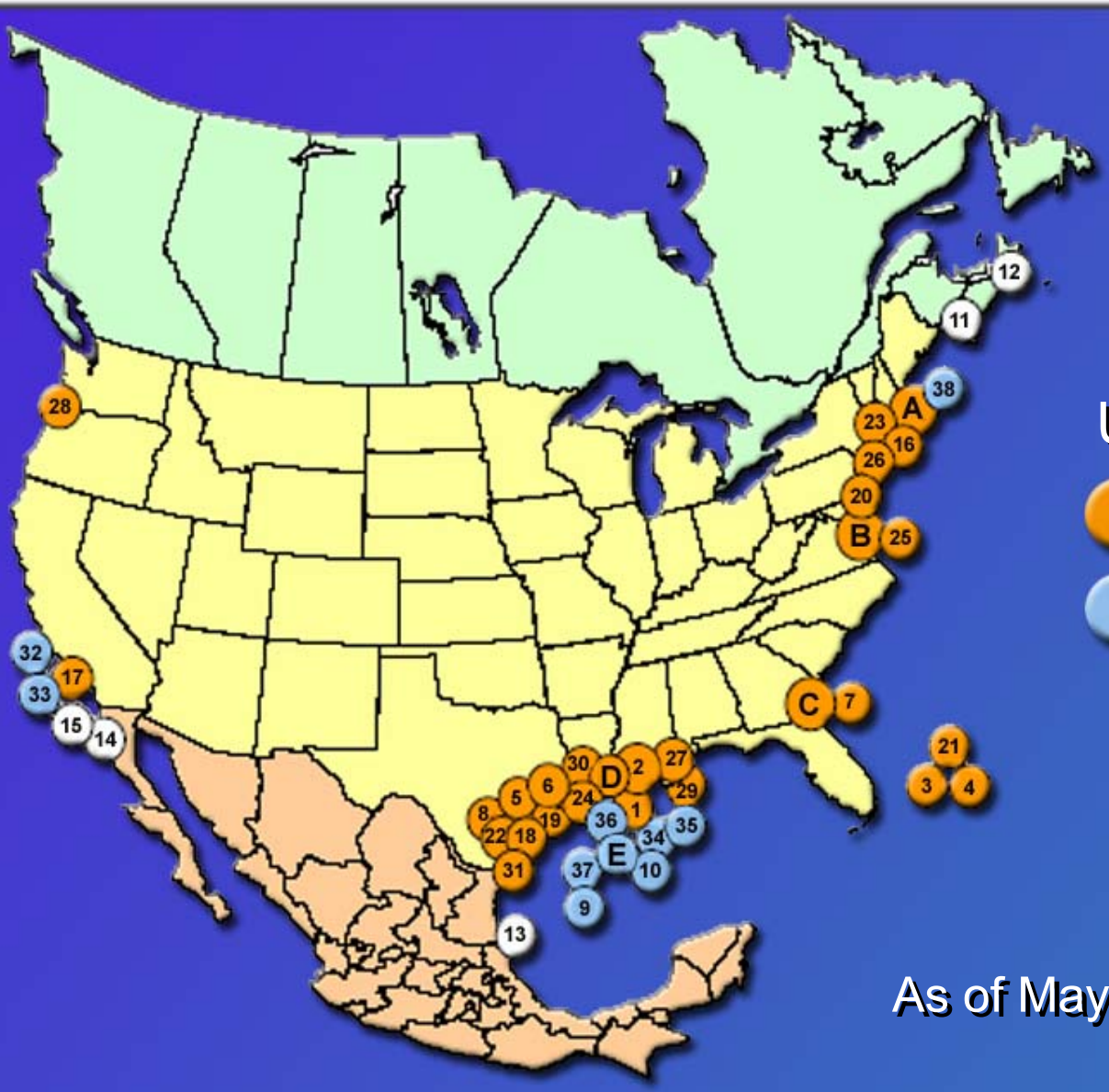
LNG Marine Terminal Cycle

Time to Construct:

- 5-6 years to complete the terminal
- 25 month minimum for LNG tank construction
- Cove Point expansion time from customer contract execution to facility in-service:
  - Approx. 4 years, 5 months
  - No new marine facilities

LNG Marine Import Terminals Sites Pending

Existing and Proposed LNG Terminals



US Jurisdiction

FERC

Coast Guard

As of May, 2005

Which Projects Will Be Successful?

The sites with the best chance of success are:

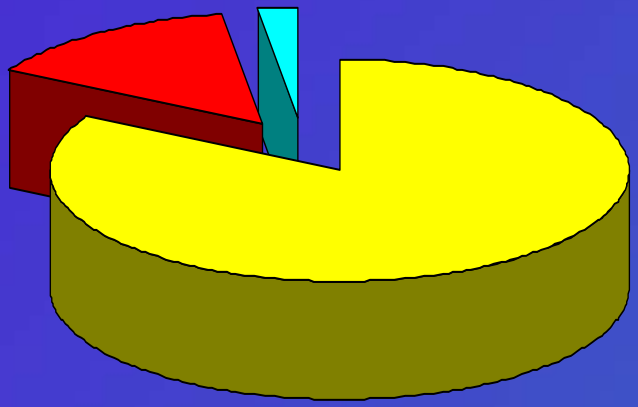
- Existing U.S. Terminal Expansions
- West Gulf Coast Area Projects
- Projects in Mexico and Canada

Which Projects Will Be Successful?

Conclusion:

Some proposed LNG import proposals must succeed to meet future demand

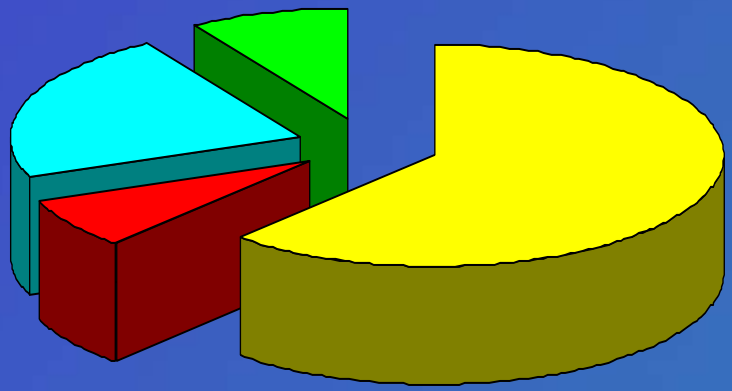
Sources of U.S. Natural Gas Supply 2003



22.5 Quads

Lower 48 Canada LNG

Expected Sources of U.S. Natural Gas Supply - 2020



30.7 Quads

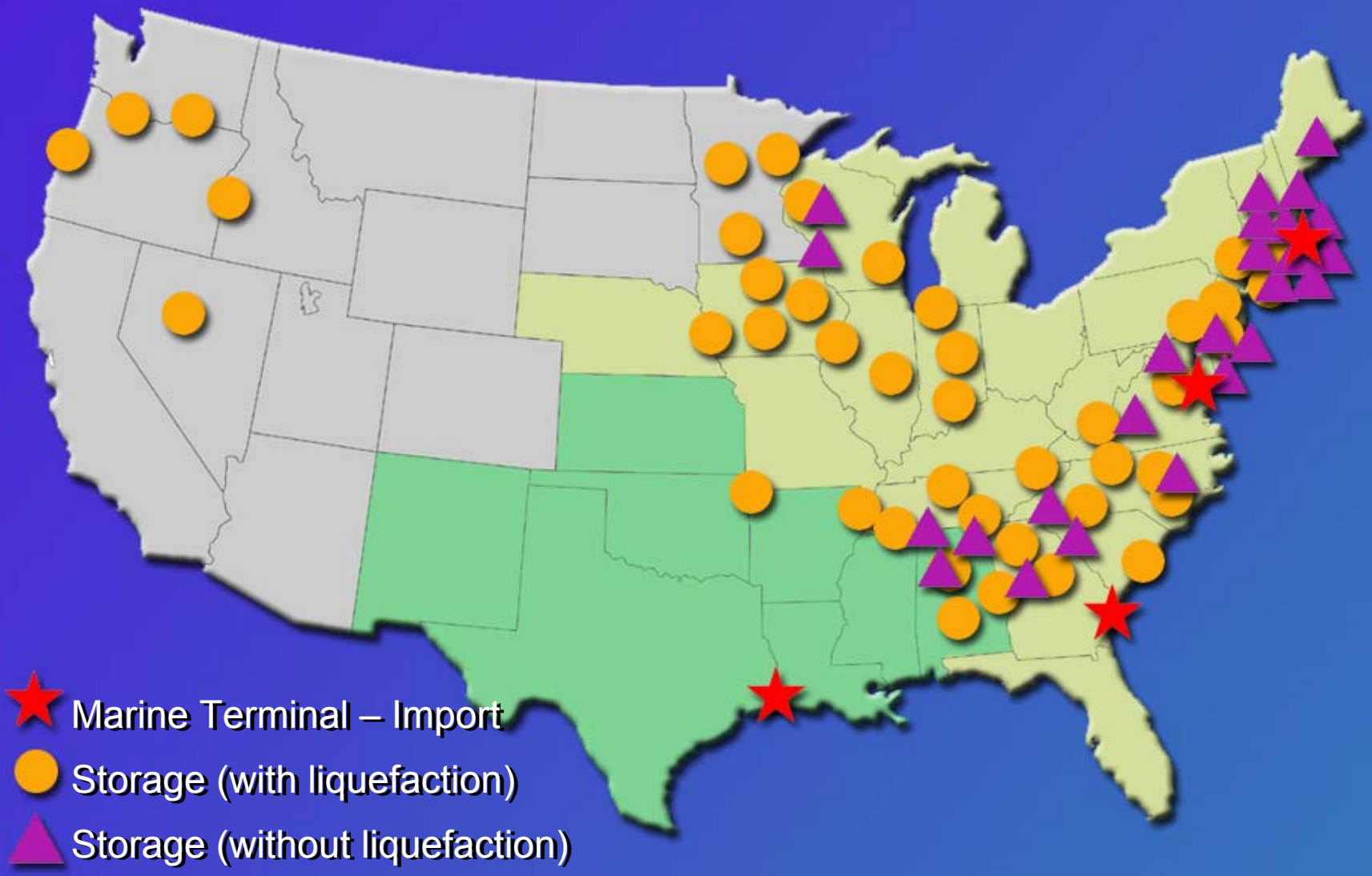
Lower 48 Canada LNG Alaska

Source: American Gas Association

Existing LNG Assets in Virginia

Facility Name	Company	Status	Liquefaction (MMcf/d)	Vaporization (MMcf/d)	Capacity (MMcf)	Injection (Days)	Withdrawal (Days)
Chesapeake	Columbia Gas Transmission	Active	5.00	120.00	1,200.00	240.00	10.00
Lynchburg	Columbia Gas Distribution	Active	0.00	6.00	41.00	0.00	7.00
Troutville	Roanoke Gas Co.	Active	1.00	21.00	200.00	200.00	10.00
Totals			6.00	147.00	1,441.00	440.00	27.00

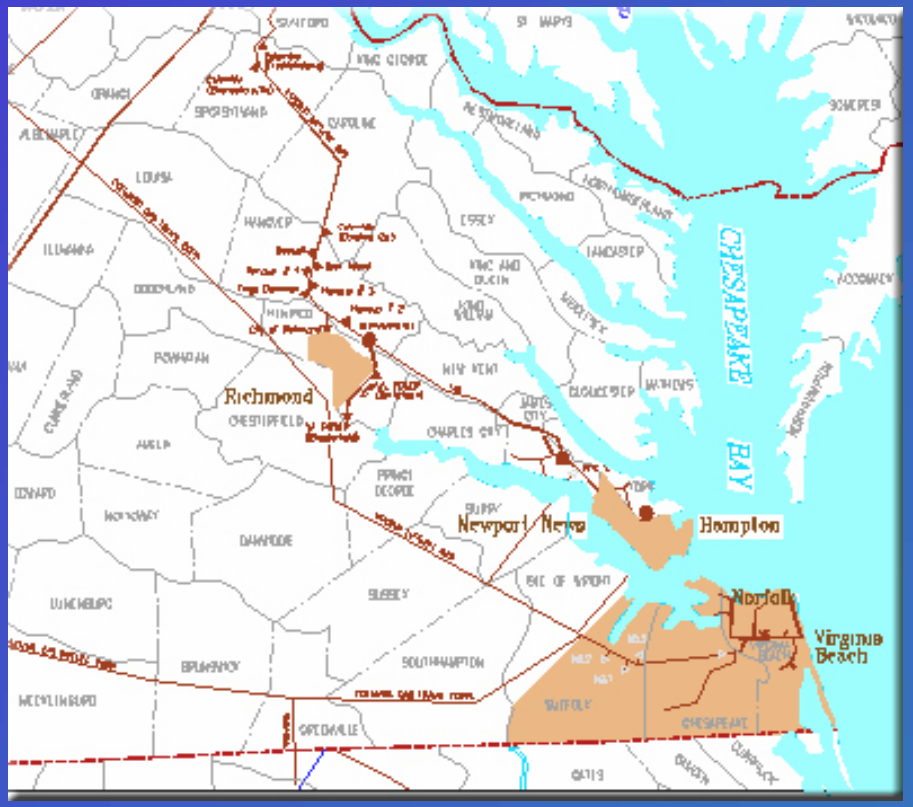
LNG Storage Sites



Source: Energy Information Administration, 2004

Potential for Terminal in Virginia

- None of the proposed terminals are located in Virginia
- No large transmission pipelines are in place to transport natural gas from the Virginia coast to market



Facilitating the Permitting Process

- Timing of public announcement is critical
  - Must have sufficient information to present an organized scope and schedule
  - Must be early in the process to incorporate concerns into design and siting
- Single point of contact for permits (federal/state/local)

Possible Incentives for LNG Facilities

- Tax credits
- Use of industrial development bonds
- Create siting board to expedite process

Summary:

Potential does exist for the development of LNG and pipeline facilities in Virginia, and further investigation is needed

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