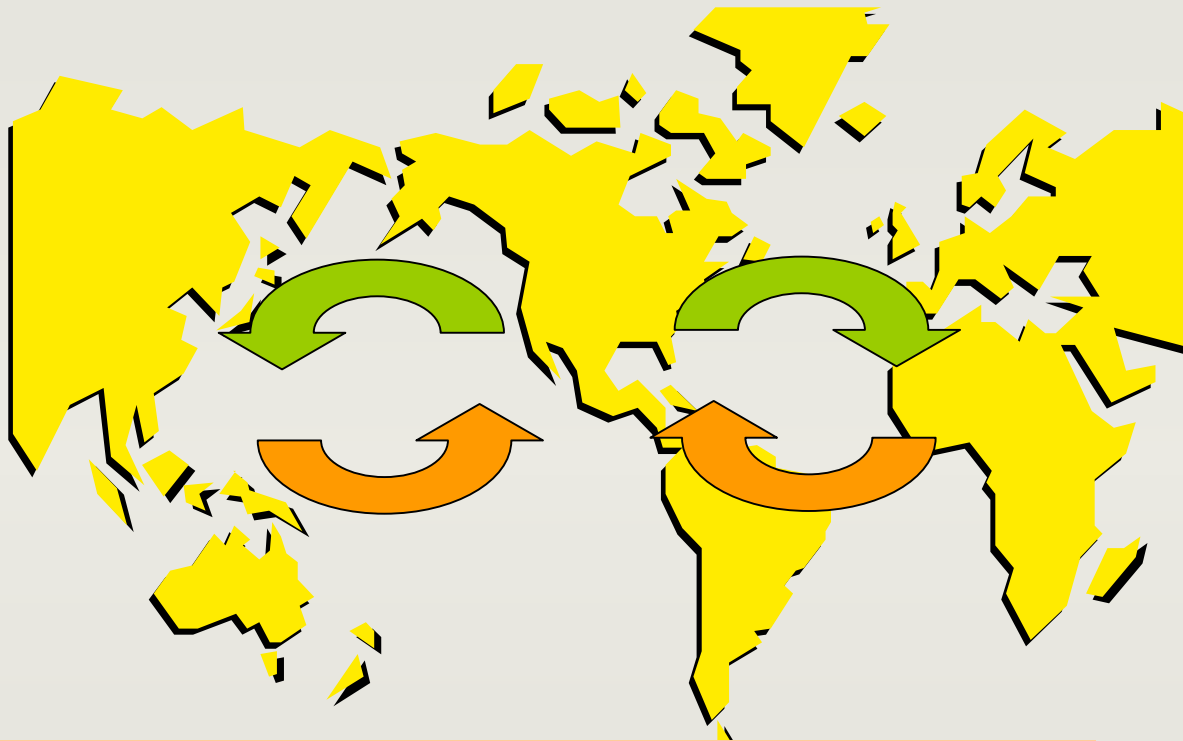


UNIVERSITY OF HOUSTON LAW CENTER
INSTITUTE FOR ENERGY,
LAW & ENTERPRISE



LNG: Can We Build It?

Global Gas Market Evolution and Arbitrage: Why North America Matters

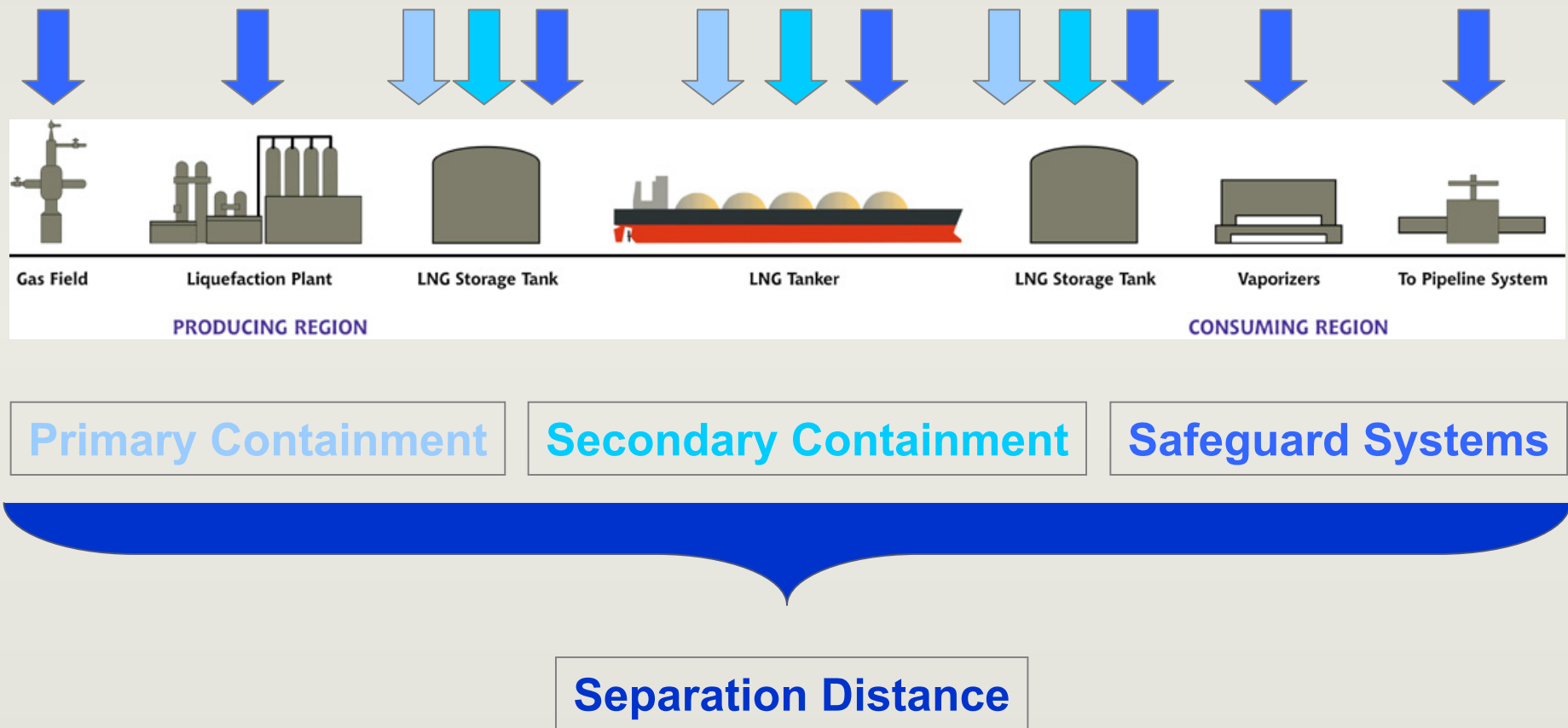


Orange arrows are generally LNG cargo flows to U.S. for Henry Hub premiums. Green arrows are generally price flows to other markets if Henry Hub sets a premium.

Key considerations:

- Economic regulation of U.S. terminals and jurisdiction
- Pipeline takeaway capacity
- NGL content of LNG cargos vs. terminal design and pipeline standards (interchangeability)
- Evolution of short term LNG contracting mechanisms

Example Applications of Multiple Layers of Protection Along the LNG Value Chain



Issues

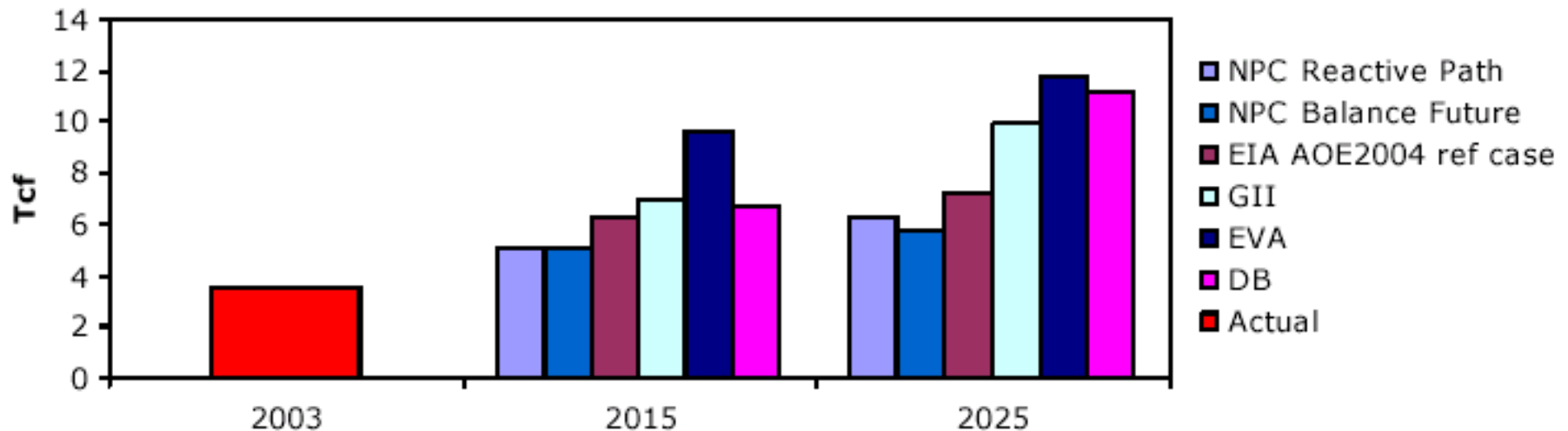
- Public acceptance of messaging on safety assurance
- Fear of catastrophic failure – vapor clouds, pool fires
 - Inability to communicate probabilities, high degree of emotion
- Preparation of first responders
- Federal/state/local coordination
 - FERC requirements for safety, role of states
- Federal-level inter-agency communication
- Ability to organize opposition
- News media coverage

Status

- U.S. Proposed – 15
 - 4 FERC or USCG approved
 - 5 face significant opposition
 - Several face commercial issues
- U.S. Planned – 10
 - 6 face significant opposition
- Outside U.S.
 - Bahamas: 3 proposed, 2 FERC approved pipes (1 opposed)
 - Canada: 3 proposed, no (observable) opposition
 - Mexico: 1 planned (permitted), 1 approved (opposed)
- Total withdrawn: 5 (1 in Mexico, 1 U.S. defeated by voters)

Projected U.S. Import Requirements

Total U.S. demand projected to be 26.5 Tcf in 2015, 29.7 Tcf in 2025, U.S. EIA reference case.



Source: Derived from U.S. EIA, IEA, NPC data

*UH IELE, North American Natural Gas Supply-Demand Balances and Energy Security: A Role for LNG?
2004 (forthcoming).*

Summary: NPC Outlook, 2030 (Approx. 5 Tcf/y, Base Case)

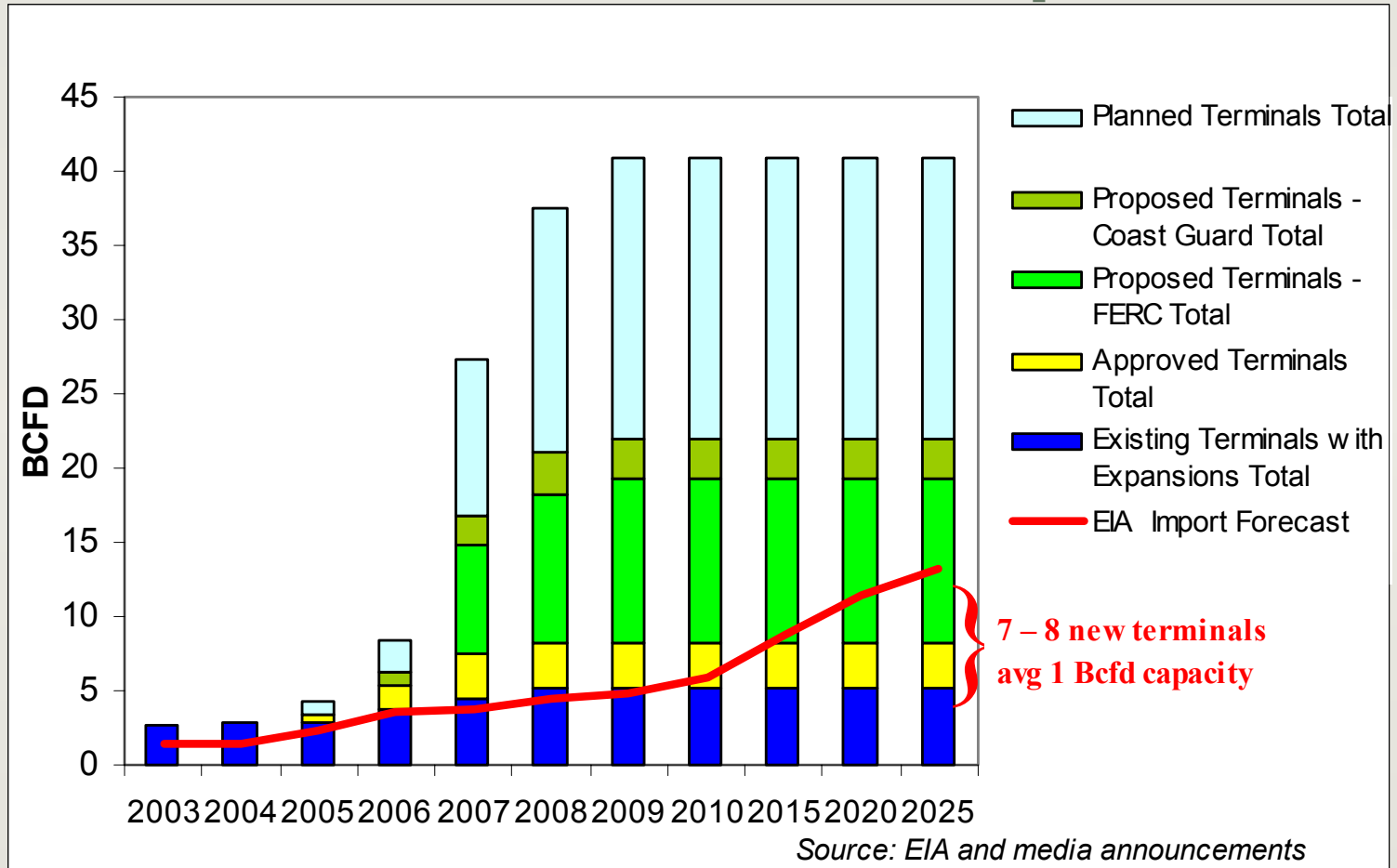
Balanced

- Expansions to 3 existing facilities
- **7 new facilities**
- 4 expansions of new facilities
- **12,550 MMcf/d send out, 4.6 Tcf/y**

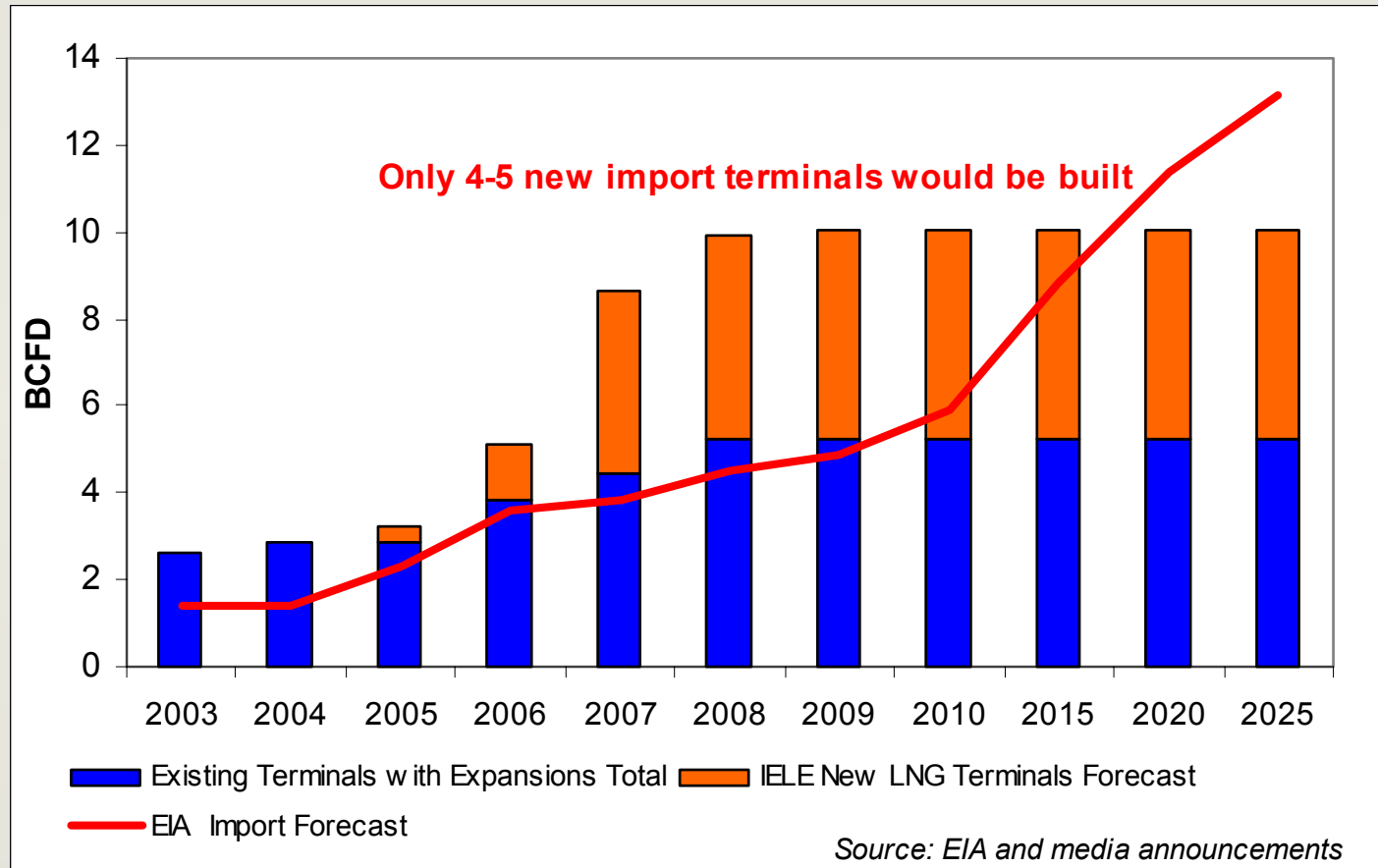
Reactive

- Expansions to 3 existing facilities
- **2 new facilities**
- 1 expansion of new facility
- **6,550 MMcf/d send out, 2.4 Tcf/y**

Aggregate of Known Projects: Unsustainable Development



UH IELE Outlook: “Current Path”



Case Study: Japan

	U.S.	Japan
Liquefaction Terminals	1	
Import Terminals	4	23
Peakshaving Facilities	57	
Satellite Storage Facilities (without liquefaction)	39	26

- Historically strong collaboration between industry and government
- 10-year planning cycle with METI
- Binding agreements with prefecture/local governments
- Going forward – public concerns toward industrial development, lack of developable sites means more creative use of existing infrastructure and new commercial arrangements

For More Information

- Public education initiatives - examples
 - University of Houston, Institute for Energy, Law & Enterprise, <http://www.Energy.Uh.Edu/LNG>
 - Center for LNG
<http://www.lngfacts.org/>
 - The DOE/NARUC LNG partnership
<http://www.Naruc.Org/programs/lng/> announced by Secretary of Energy Spencer Abraham in Sept. 2003
 - Gas Processors Association (GPA) LNG committee
<http://www.Gasprocessors.Com/LNG.Html>
 - SITTGO film on LNG (under advisement)
<http://www.Sigtto.Org/>
 - The International LNG Alliance (ILNGA) www.lnga.org

IELE LNG Research Consortium:

www.energy.uh.edu/lng

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