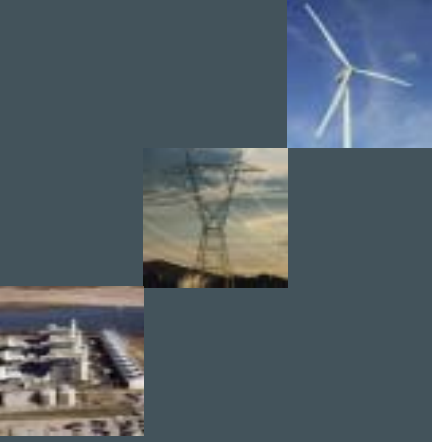


Babcock & Brown

Trans Bay Cable Project

Presentation
To
California Energy Commission
Transmission Workshop
August 23, 2004

BABCOCK & BROWN

Trans Bay Cable Project

- General Project Description
- Estimated Project Benefits and Costs
- Project Participants

Trans Bay Cable Project

General Project Description

Trans Bay Cable Project - Summary

- **The Project will be a new High Voltage Direct Current (HVDC) transmission system from the generation rich East Bay (PG&E Pittsburg Substation) into San Francisco (PG&E Potrero Substation)**
  - Cooperative development with City of Pittsburg
- **DC technology has been proven reliable and effective in other jurisdictions**
  - Power control feature mimics local generation, with higher reliability than a generator
  - Siemens/Pirelli will supply the HVDC converter stations/interconnecting cables
- **Significant monetary, reliability and environmental benefits, including retirement of all generation in San Francisco**
- **Revenue recovery based on FERC-approved cost-based rates under a PTO tariff with the CAISO**
  - Babcock & Brown will provide the financing
  - City of Pittsburg will own the Project assets
  - Transmission rights will be turned over to the CAISO under a negotiated Transmission Control Agreement
- **Schedule: Commercial Operation Date anticipated to be late 2007/early 2008**

Trans Bay Cable Project – HVDC System Attributes

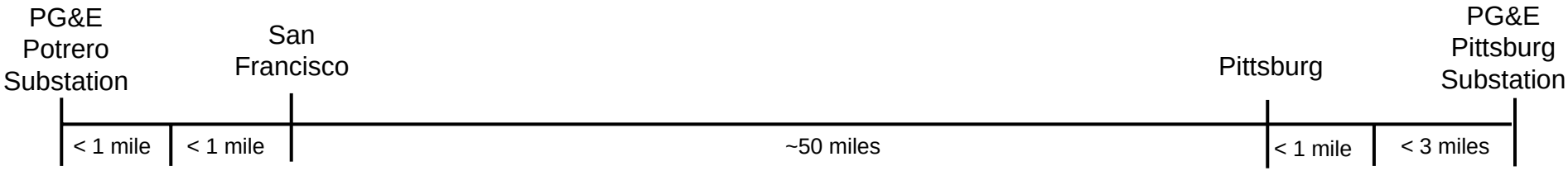
- ***Controllable Power*** - Exact power flow - Generation to Load
  - ***Operational Flexibility –*** ability to “dial in a flow”
- ***Invisible Transmission -*** Energy exchange via Sea Cable
- ***Firewall Protection –*** AC system disturbances kept isolated
- ***Enhancement*** of AC system stability
- ***No Increase*** of Short-Circuit Current
- ***Reduced*** System Line losses
- ***Inherent*** Overload Capability (10% continuous overload duty; up to 25% for up to 4 hours)
- ***Reactive Power*** control / support of AC voltage

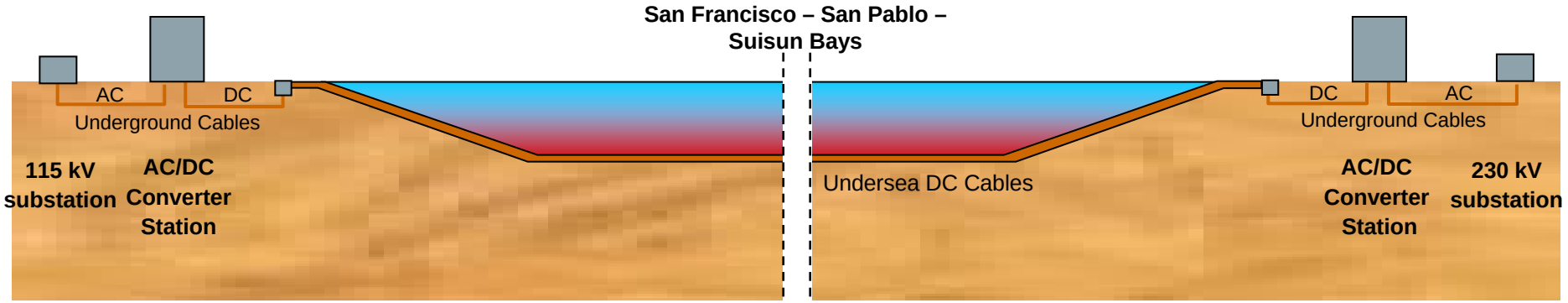
Trans Bay Cable Project – Submarine Cable Route

Trans Bay Cable Project – Cable Interconnections

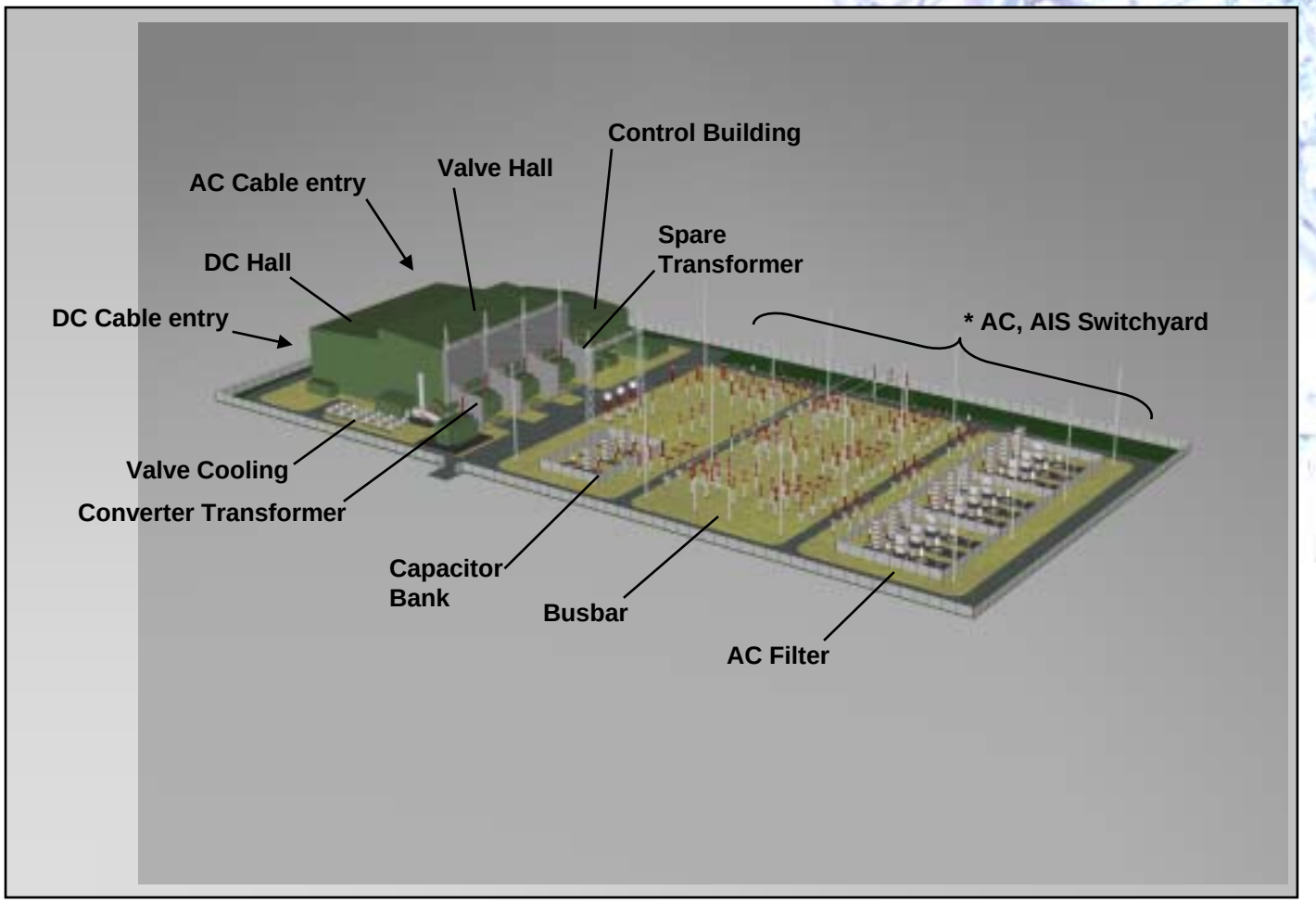
System Data:

Transmission Capacity:	up to 600 MW
DC Voltage:	± 500 kV DC





Trans Bay Cable Project – Typical AC-DC Converter Station



Trans Bay Cable Project – Aerial View of Proposed Site in Pittsburg – Option 1

Trans Bay Cable Project – Aerial View of Proposed Site in San Francisco – Option 2

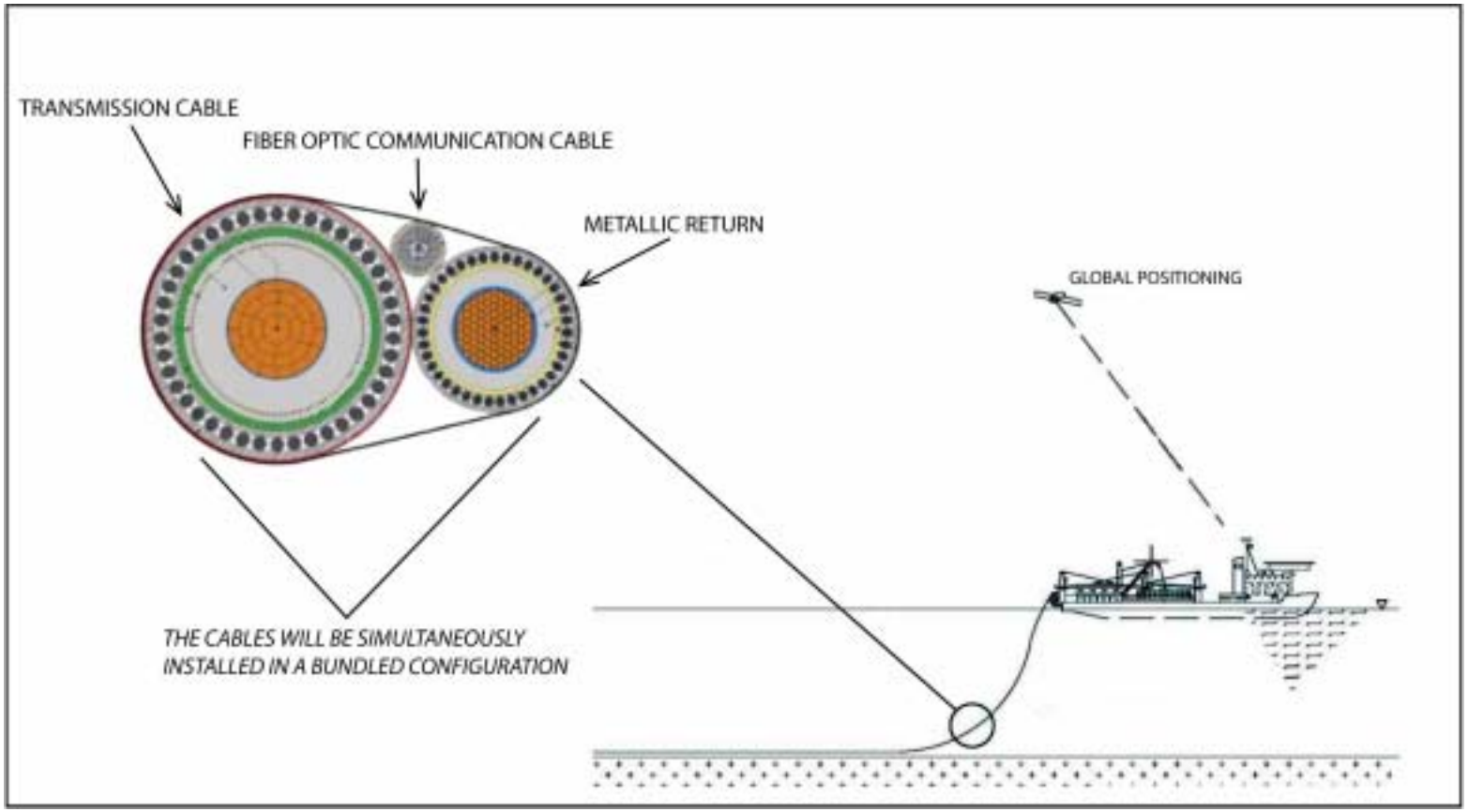
Trans Bay Cable Project – Proposed Cable Laying Vessel

Cableship – *Giulio Verne*

Main features

- Length Overall 133 m
- Moulded Breadth 30 m
- Draft 8.5 m
- Gross Tonnage 10,617 tons
- Dynamic Positioning Control
- Total propulsion Power 5,710 kW
- Capstan 6 m diameter, 50 tons pulling tension
- Linear laying machine 10 tons pulling tension
- Turntable, external dia. 25 m, capacity 7,000 tons

Trans Bay Cable Project – Cable Laying and Burial Operation Will Take Approximately One Month*

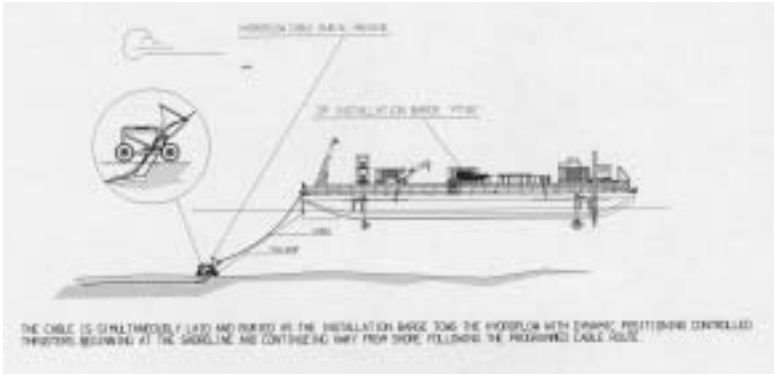


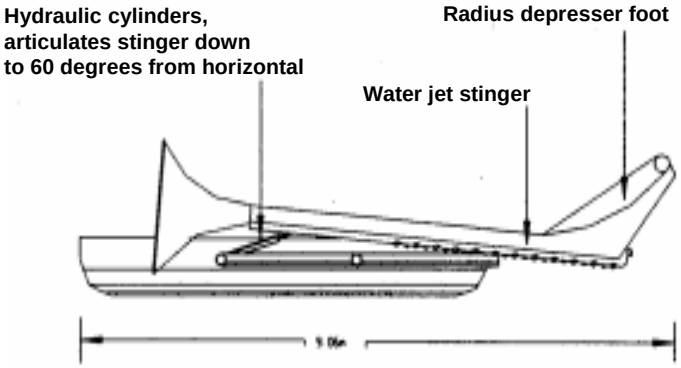
*A short installation schedule will avoid spawning seasons and fisheries issues.

Trans Bay Cable Project – Cable Burial Operation Using Hydroplow Operated From Barge

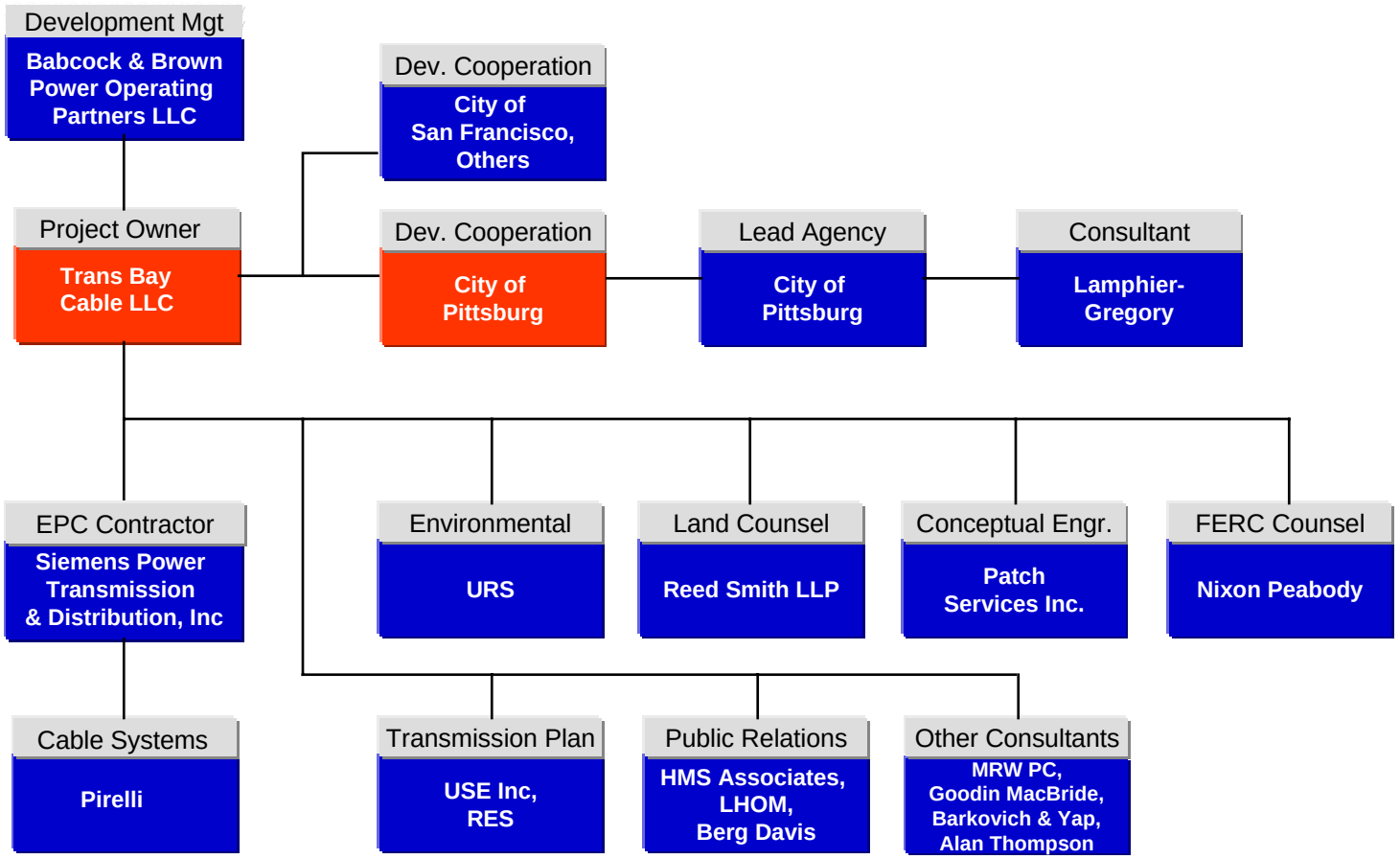
Hydroplow-3 Power Cable Embedment Sled

PT-46 DP BARGE
for use in shallow water

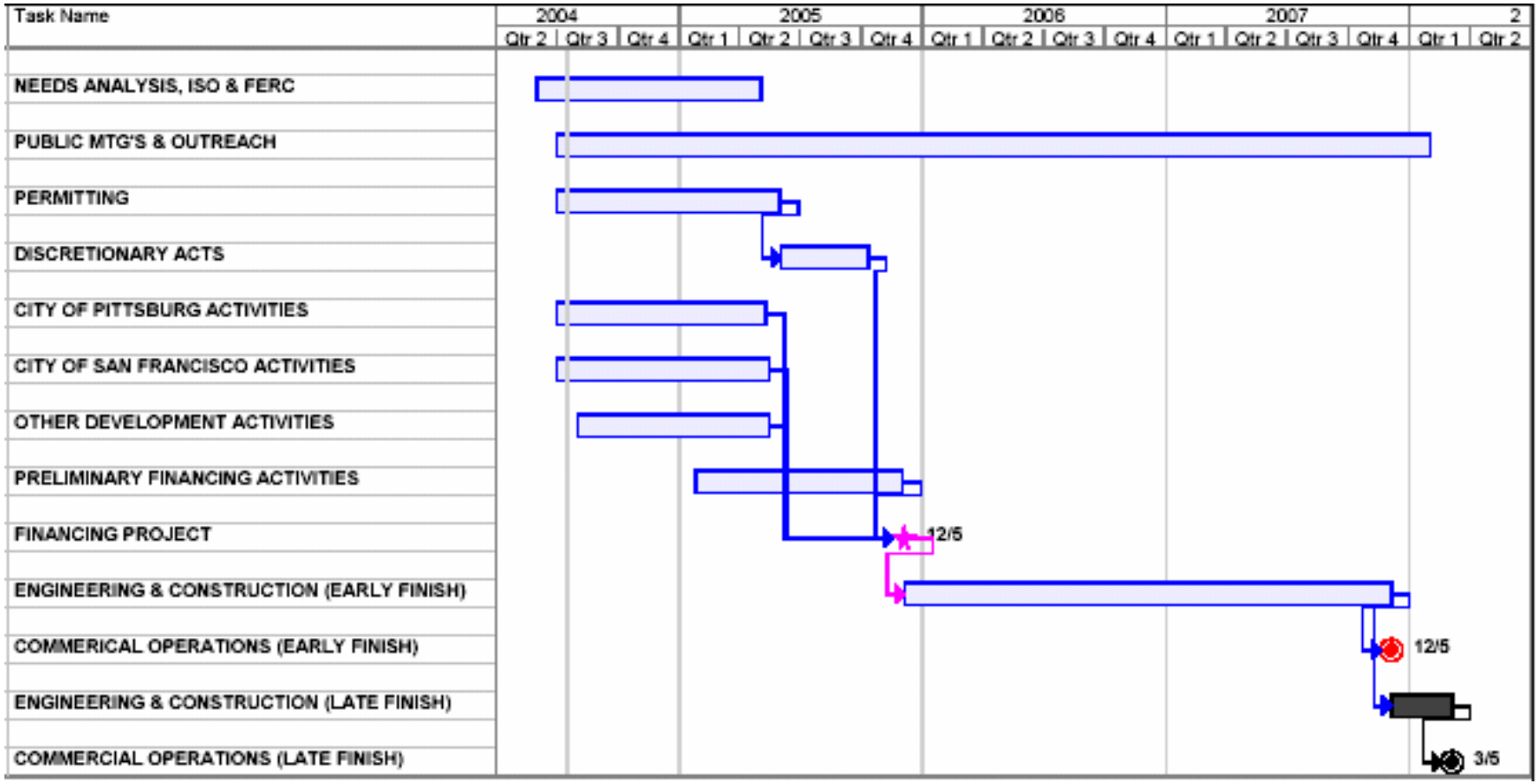




Trans Bay Cable Project – Development Team



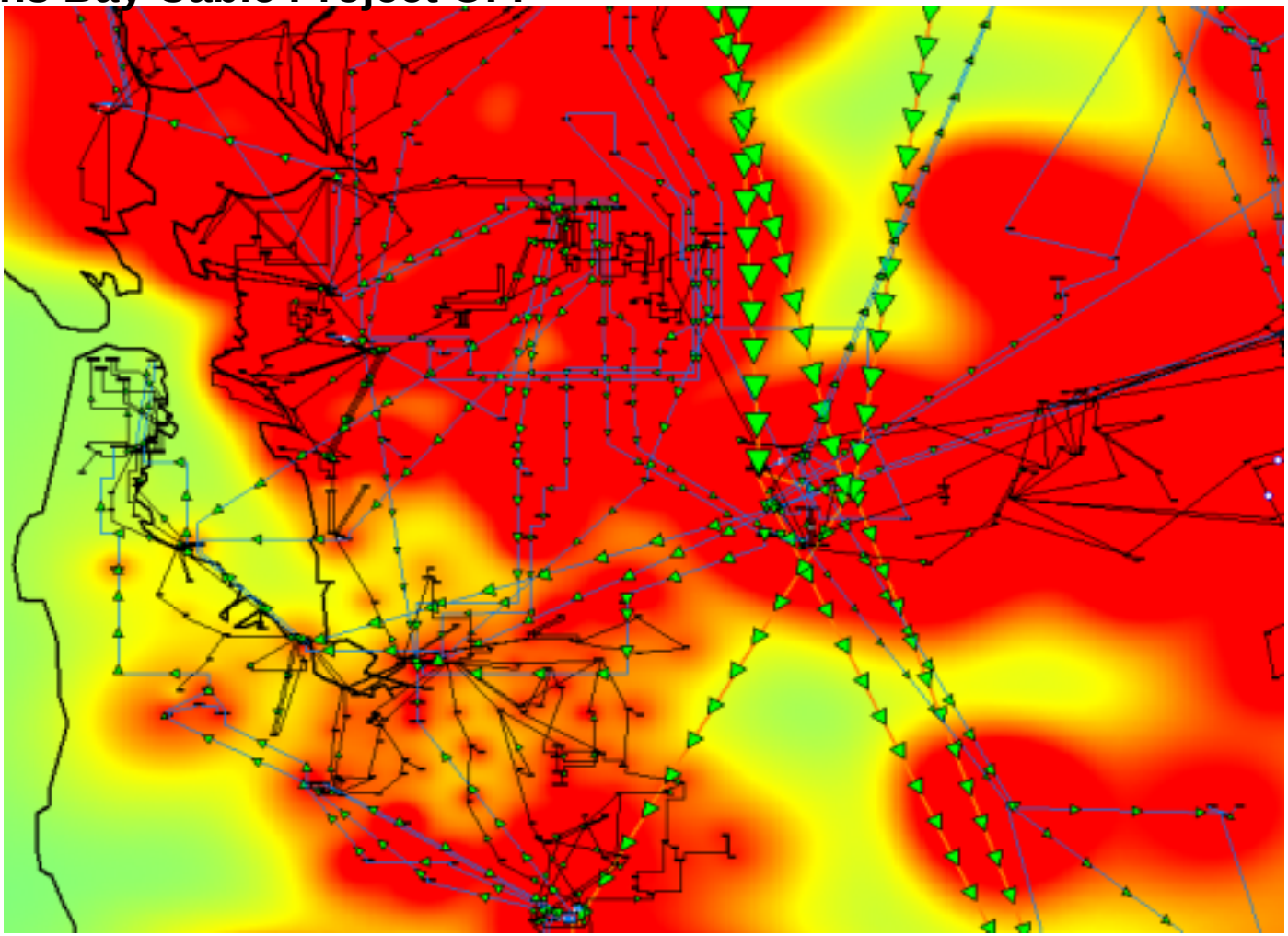
Trans Bay Cable - Schedule



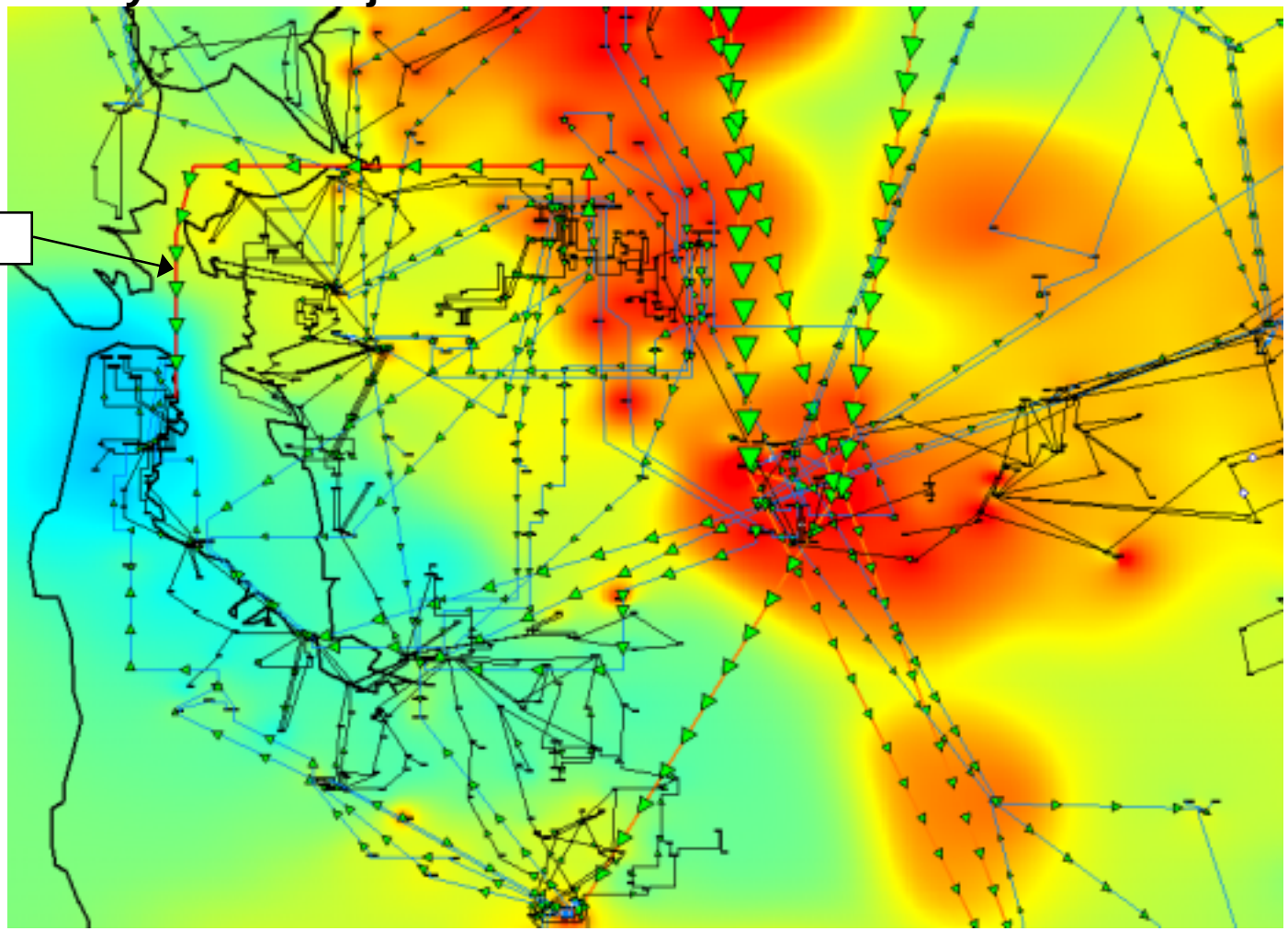
Trans Bay Cable Project

Estimated Project Benefits and Costs

Trans Bay Cable Project - Plots Showing Greater Bay Area Power Flows – Jefferson-Martin ON, Potrero ON, Hunters Point OFF, Trans Bay Cable Project OFF



Trans Bay Cable Project - Plots Showing Greater Bay Area Power Flows – Jefferson-Martin ON, Potrero OFF, Hunters Point OFF, Trans Bay Cable Project ON



Trans Bay Cable Project – Comparison of Estimated Project Benefits and Costs

- **Summary of Estimated First Year (2008) Benefits ($/yr)***

	600 MW	400 MW
- Loss Reductions	$19 million	$16 million
- Project Deferrals	Negligible	Negligible
- RMR	To be determined	To be determined
- Economic Dispatch	$55 million	$55 million
TOTAL	$75 million	$71 million

*These benefits will escalate as market power prices escalate

- **Summary of Estimated Annual Costs**

	600 MW	400 MW
First Year (2008) Cost	$86 million	$65 million
30 Year Average	$70 million	$53 million

Trans Bay Cable Project – Additional Project Benefits

- **Significant Environmental Benefits**
  - Retirement of all generation in San Francisco
  - Clean system power will serve San Francisco
  - Emissions reduction from up to 36 MW power production reduction due to system loss savings
  - Terminals produce no pollution, no moving parts, little noise, primarily housed in a building
- **Enhanced Reliability**
  - Power control feature of DC mimics local generation, with higher reliability than a generator
  - Pittsburg – San Francisco line “completes the Greater Bay Area (“GBA”) transmission loop”, benefiting the entire Bay Area
  - System security increased as buried DC cables will be in a separate corridor from any existing AC lines
  - Reduced power flow on existing Peninsula and East Bay lines
  - More load serving capability than other alternatives being considered
  - No problems found in N-1, N-2 contingency analyses using std criteria used by California ISO (including special criteria for GBA) and WECC

Trans Bay Cable Project - Appendices

Project Participants

Babcock & Brown – Key Facts

- **Specialists in arranging financing for, managing, and acquiring a target spectrum of "big ticket" assets such as power generation and transmission assets, aircraft, and rail cars around the world**
  - Financial Advisor/Placement Agent
  - Asset/Funds Management
  - Principal Investing
- **$110 billion of asset-based financings and acquisitions arranged over the past five years ($17 billion in 2003)**
- **Over $6.5 billion of power, aircraft, rail and infrastructure under management**

- Founded in 1977
- 465 Employees in 22 offices and 14 countries
- 80% employee owned and 20% owned by HypoVereinsbank (HVB)

City of Pittsburg – Key Facts

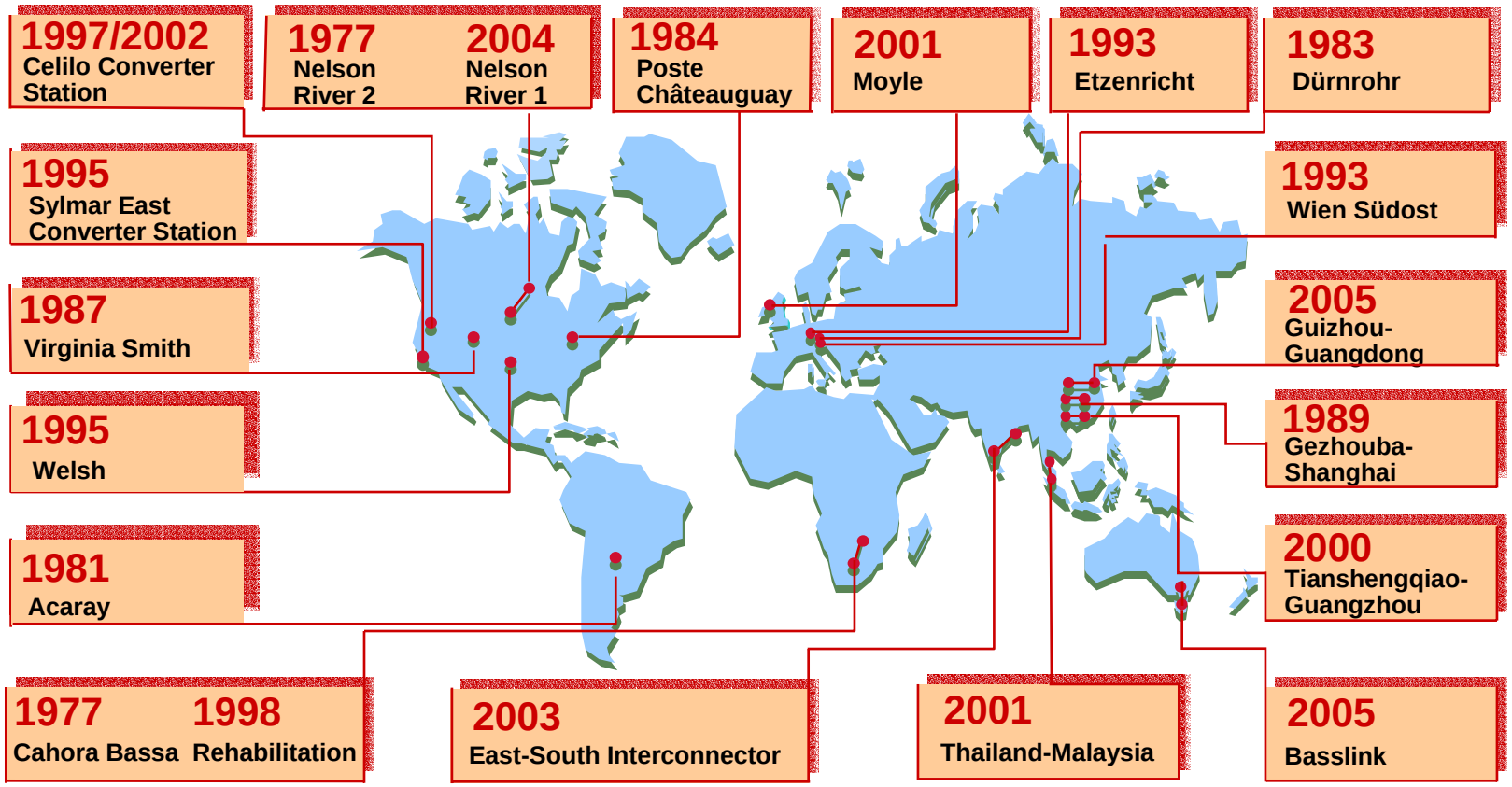
- City of Pittsburg Established 1903 near confluence of the Sacramento and San Joaquin Rivers in the Sacramento River Delta
- Population today approximately 60,000
- Municipal Utility (Pittsburg Power Company) created in 1996
- Owner of Gas and Electric Distribution Systems on Mare Island, Vallejo, California
- Facilitated the development of the Los Medanos Energy Center (550 MW)
- Acquired Rights of Way for the Delta Energy Center transmission line (880 MW)

Siemens – Key Facts

- **Broad range of products, systems, and services for the Energy & Power, Industry & Automation, Information & Communication, Healthcare, Transportation, and Lighting markets**
  - Global Leader in electronic and electrical equipment manufacturing
  - Turnkey supplier of power generation and transmission systems around the world
  - Advanced Technology Solutions for Transmission Grids – HVDC & FACTS
- **$75+ billion in sales and $76+ billion in new orders in 2003**
- **$5.1+ billion and 45,300 employees dedicated to R&D in 2003**

- Founded in 1847
- 417,000 Employees in 192 countries
- 65,000 Employees in the USA working in 675 locations
- $16.6 billion in USA based sales for 2003

Trans Bay Cable Project – Siemens HVDC Experience



Pirelli – Key Facts

An International Group with Over 110 Years Experience

Total sales in 2003 = +$6.0 bln

77 Factories in 22 countries

33,400 Employees

1887 First Submarine Cable Installed

1906 First Submarine Cable Produced & Installed

1912 Pirelli Design World's First Ever Oil Filled Cable

1977 Commissioned first ever 1000kV Land Cable

2000 Longest AC Cable ever produced (Isle of Man-UK mainland) & deepest submarine HV cable installation at 1000m (Italy-Greece)

2002 Longest DC Cable link produced & installed by Pirelli in the Bass Strait (Australia-Tasmania)

High Voltage Test Lab