

Bechtel

Global Power Trends

*Advanced Turbine Systems
Annual Meeting*

By

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November 1999

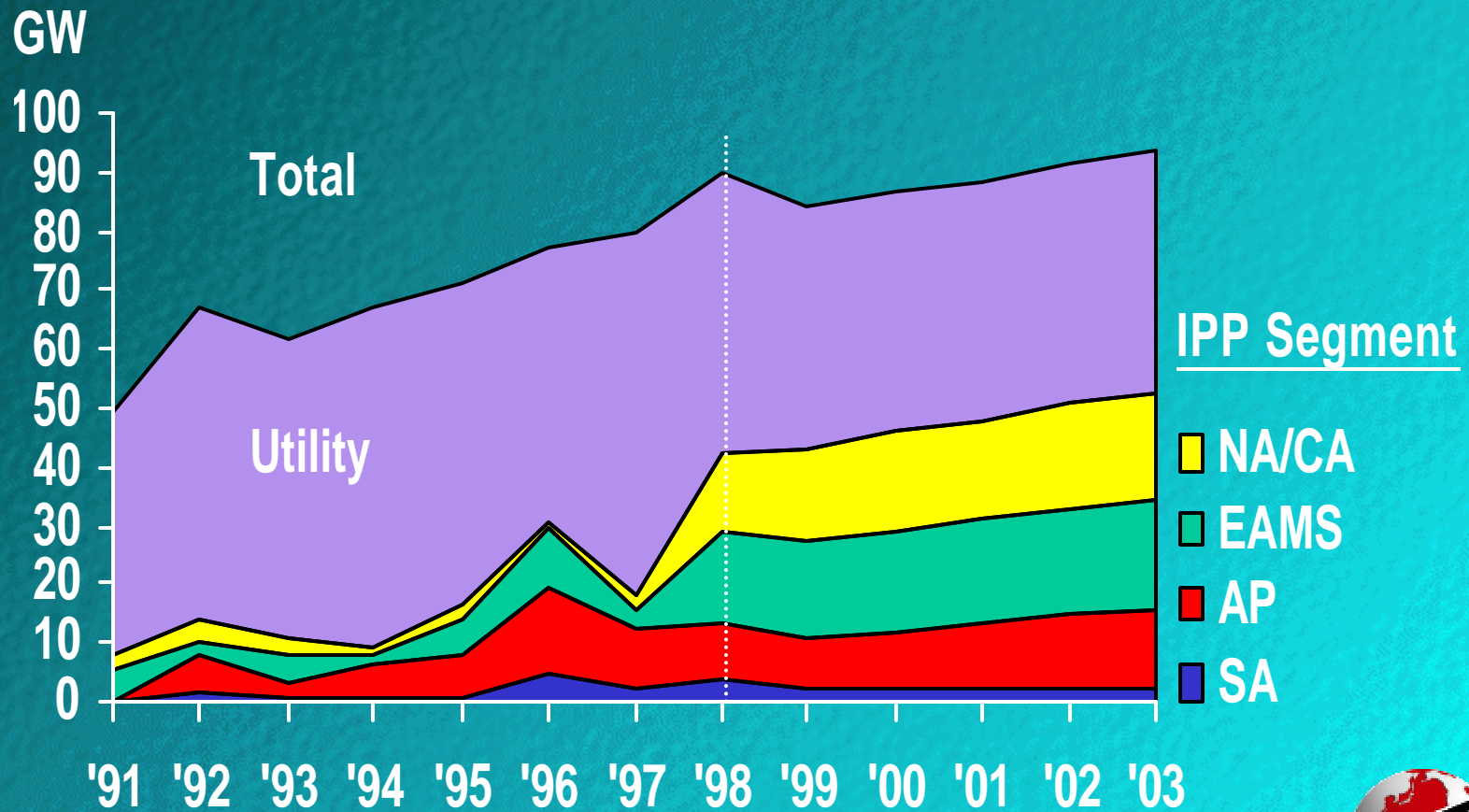


Outline

- **Developments in International Markets**
- **Technology Trends**
- **U.S. Market Trends**
- **Requirements for Successful Projects**



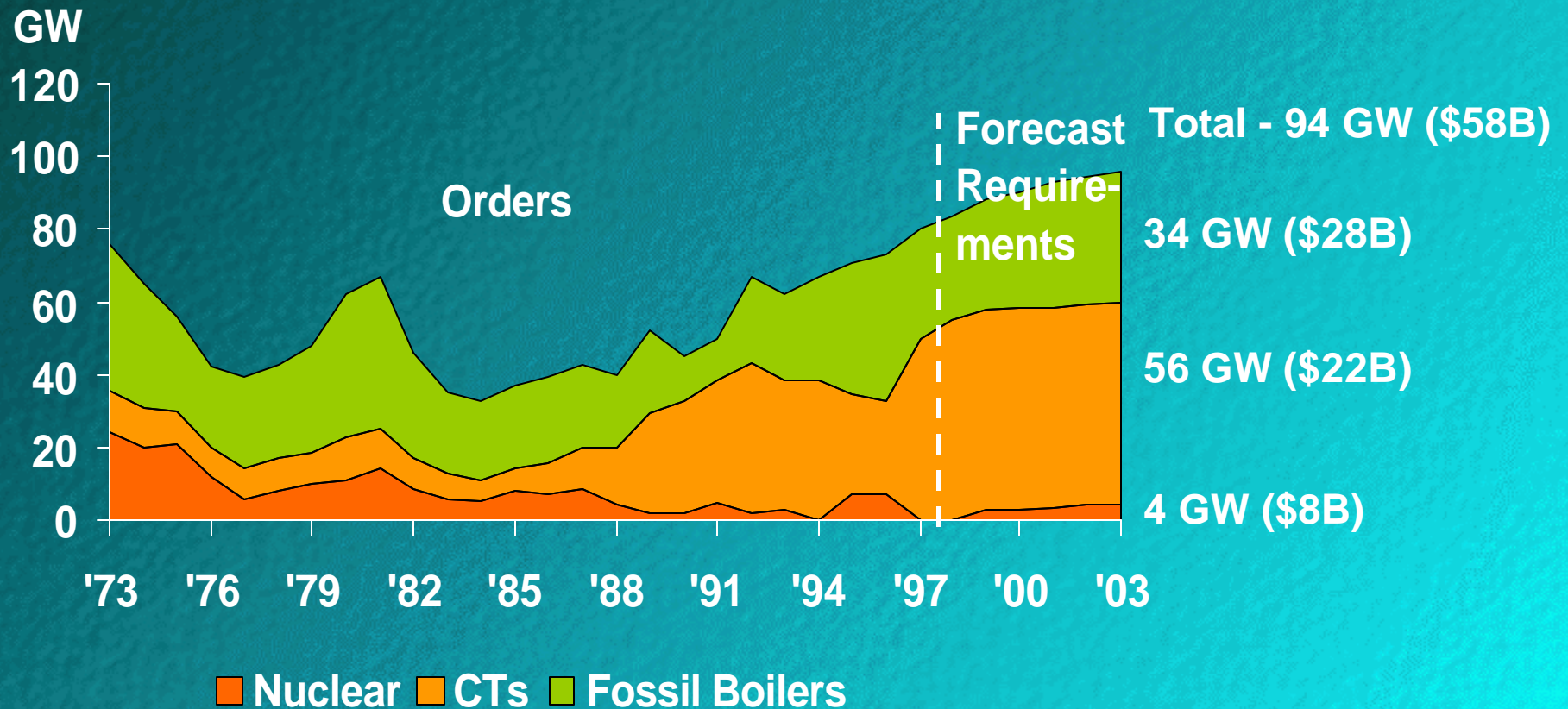
Increasing IPP Share of Total Market Orders Driving Target Market Growth



Total Market Growth of 3-4% / Year 1998 through 2002



Total Market Orders / Requirements*



**Excludes Hydro*

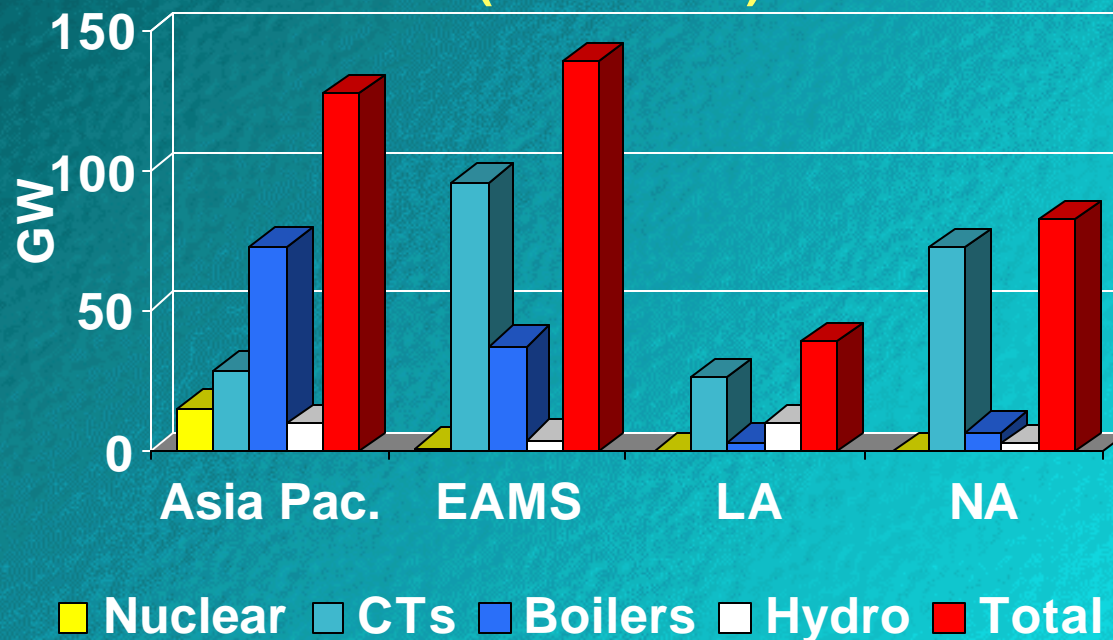
Source: McCoy Power Reports Historical;
Bechtel Forecast for Future Requirements



Technology Trends Indicate Gas is Fuel of Choice

- N. America/L. America are primarily Combustion Turbine (CT) markets
- Significant Boilers (50% of world market 1997) in Asia Pacific, some Nuclear
- Some boilers in Europe, Africa, Middle East and Southeast Asia

Total Market/Regional Technology Share (1999-2003)



*Excludes Hydro
Source: McCoy Power Reports



Technology Trends Indicate Gas Is Fuel of Choice

- **Gas is Preferred Fuel Due to:**
 - ◆ Economics
 - ◆ Speed to market
 - ◆ Permitting/siting
 - ◆ Growth in competitive deregulating markets

- **Other Driver is Gas Availability**
 - ◆ Increase in reserves throughout world
 - ◆ Dramatic increase in pipeline development

- **Coal Boiler Opportunities Continue to Exist**
 - ◆ Primarily in Asia
 - ◆ Some in N. America driven by unique fuel pricing/mine-mouth



Top Ten Markets in 1998

Demonstrate Role of Deregulation

1998 Financial Closings Top Ten Countries For IP P s

Rank	Country	MW s	% Gas
1	U.S.	15,342	93%
2	U.K.	2,760	100%
3	China	2,700	0%
4	India	2,314	62%
5	Taiwan	2,280	42%
6	Brazil	1,595	54%
7	Canada	1,020	100%
8	Germany	950	0%
9	Mexico	934	100%
10	U.A.E.	808	100%

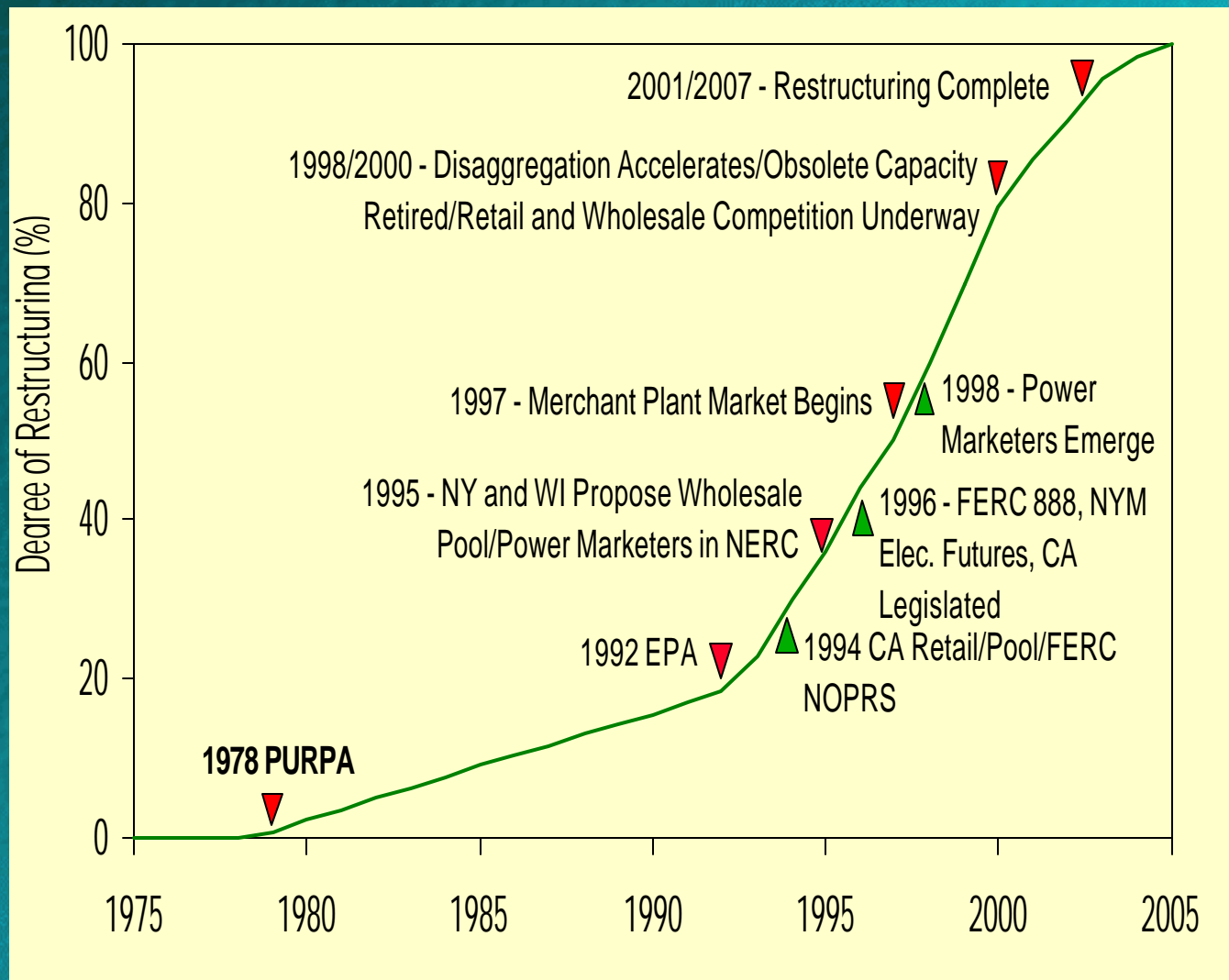


Review Of 1998 IPP Market

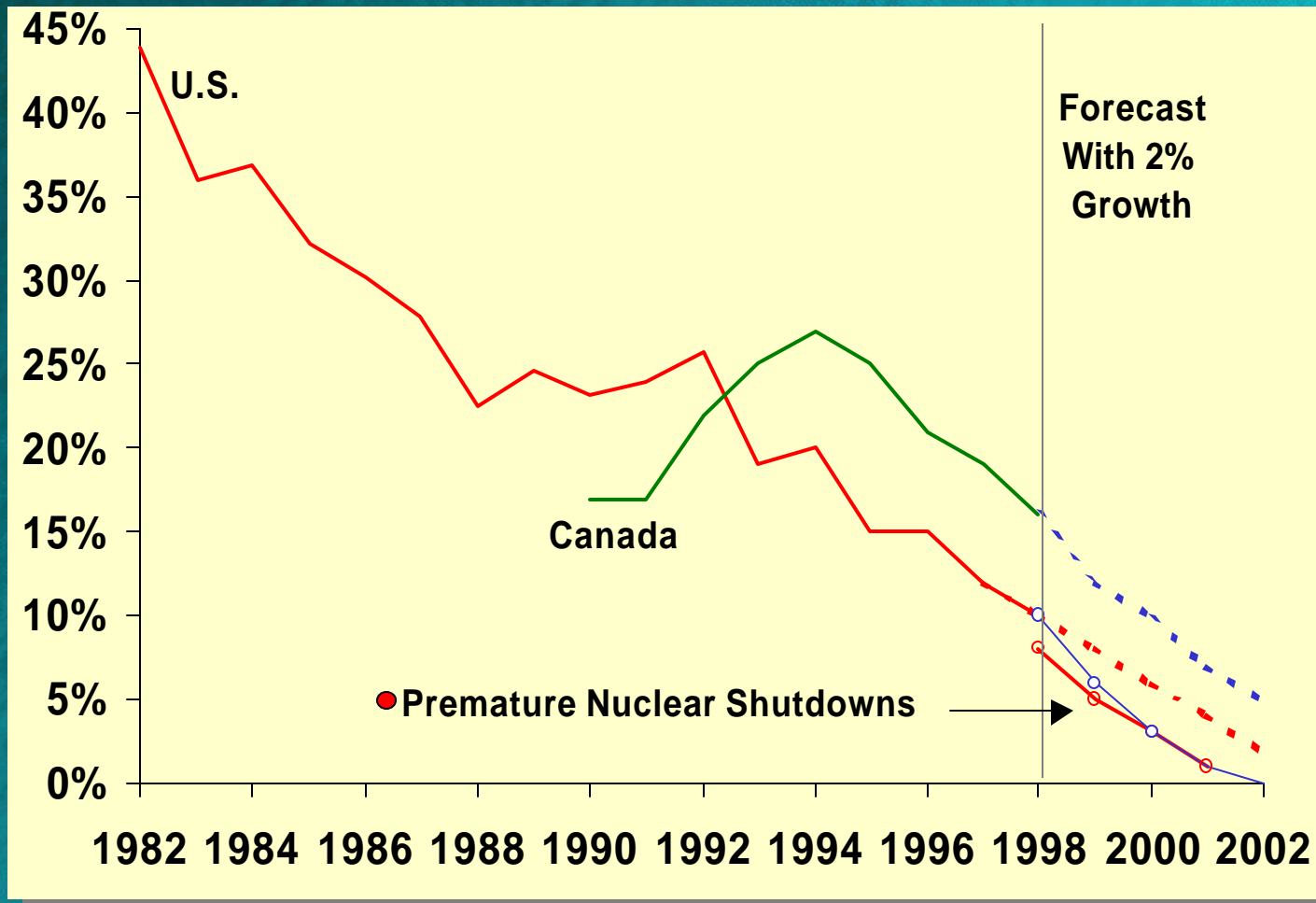
- In 1998, approximately 29 GW of IPPs reached financial closure...up from 21 GW in 1997. This includes both recourse and non-recourse financing
- Trend moving to Europe as deregulation is implemented (has already occurred in UK and is starting in Spain)
- Asia Pacific closings dropped 35% due to the fall out of the financial crisis; however, IPP opportunities still exist



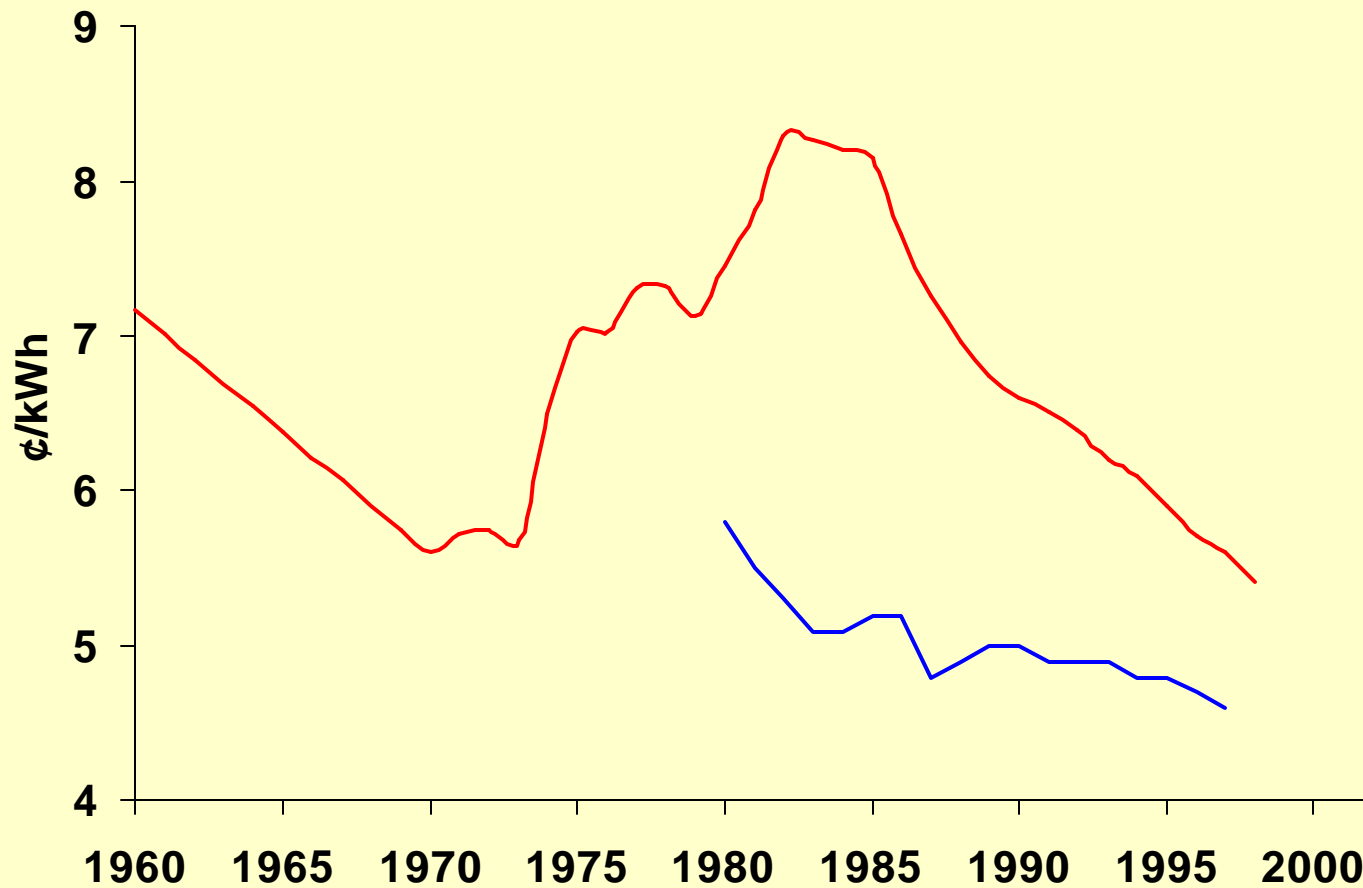
U.S. Progress in Restructuring



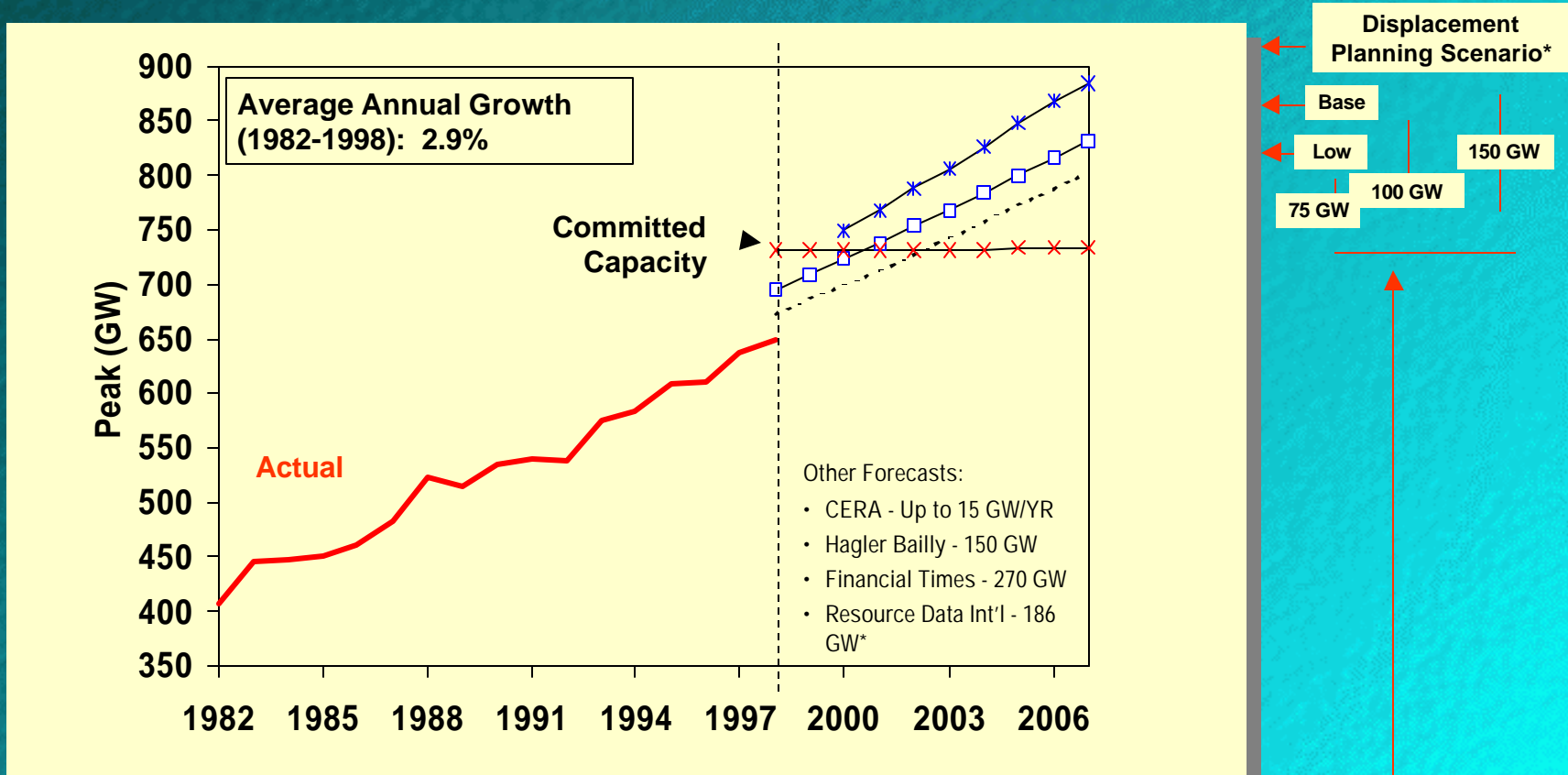
U.S. Reserve Margins... Trending Toward Zero... Canada Higher



Retail Price of Electricity (Constant \$1990)...Continues To Drop...Positive for Long-Term Growth



"Online" U.S. Supply Needs (1998-2007) Are 200 GW... Near-Term Fossil/ Nuclear Displacement Adds 50 GW



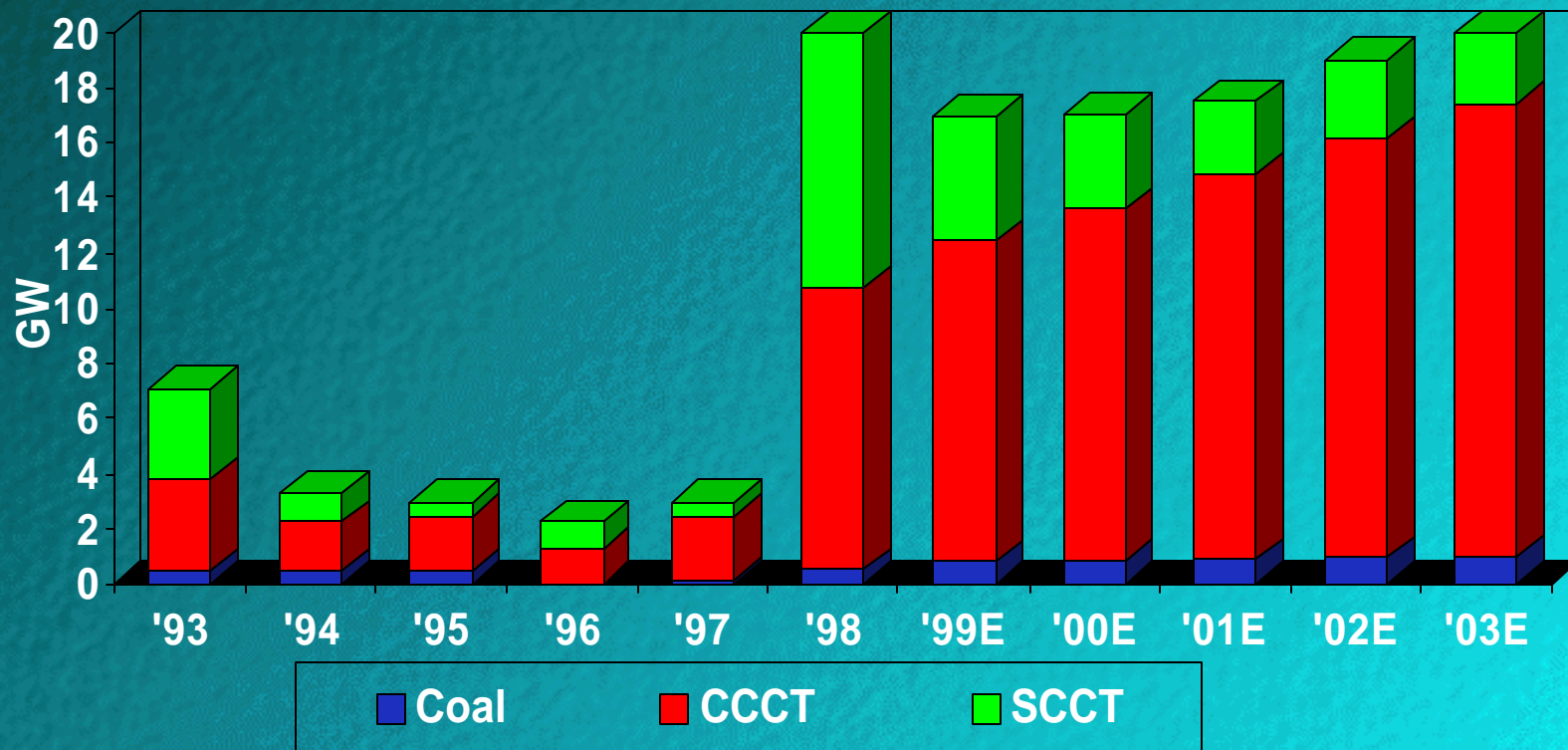
* Through 2010

Planning Scenarios ... 2% Growth
Plus:

- Low - 3.5% Reserve Margin
- Base - 7.0% Reserve Margin



Recent Orders* for New U.S. Capacity... 1998 An Upturn



***Data is U.S. Only; Canada is Similar**



Review of 1998 IPP Market

- **North America accounted for almost half of all the IPP project closings in the world in 1998**
 - ◆ **Driven by deregulation in the electric market**
 - ◆ **Many IPPs are displacement projects replacing old inefficient existing capacity**
 - ◆ **Increase in prospect activity, particularly merchant plants**



Fundamental Lessons Learned / Requirements for a Successful Project

- **Developer Credibility/Realism**
 - ◆ International presence/long-term commitment
 - ◆ Experienced resources
 - ◆ Understand and manage country risk
 - ◆ Willingness to transfer asset (BOT)
 - ◆ Share technology and profits/local partner
 - ◆ Environmentally sensitive/community focused



Fundamental Lessons Learned / Requirements for a Successful Project

- **Government Commitment**
 - ◆ True cooperation/support privatization
 - ◆ Established legal/regulatory framework
 - ◆ Foreign exchange commitment
 - ◆ Stand behind PPA; sovereign guarantee as necessary



Fundamental Lessons Learned / Requirements for a Successful Project

- **Adequate returns (risk adjusted)**
 - ◆ Capital flows to countries with the “right” investment credentials
 - ◆ Capital markets will allocate per the “global financial law of one price”
 - ◆ Required: liberalized financial systems and business oriented economic policies



Fundamental Lessons Learned / Requirements for a Successful Project

- **Economic Project/Competitive Advantage**
 - ◆ Overcoming subsidized power regimes
 - ◆ Stand-alone economics/tenor of debt
 - ◆ High capacity factors/O&M capability
 - ◆ Cost competitive: capital/life-cycle costs and financing



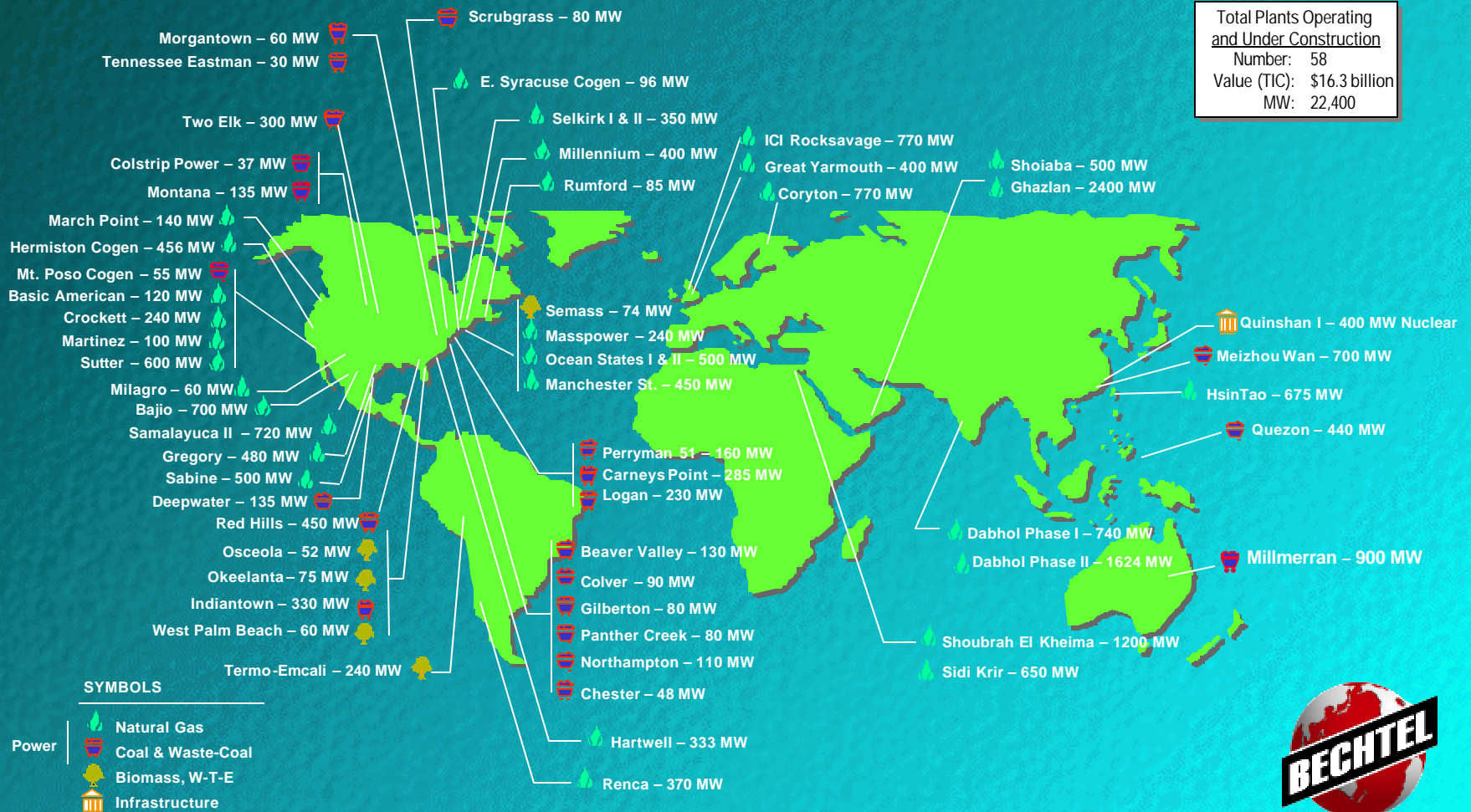
Fundamental Lessons Learned / Requirements for a Successful Project

- **International Financial Institution Supports**
 - ◆ World Bank/IFC, Exim-type agencies, ADB, etc.
 - ◆ Loans tied to privatization reforms
- **Creditworthy Contractor**
 - ◆ Cover completion guarantees



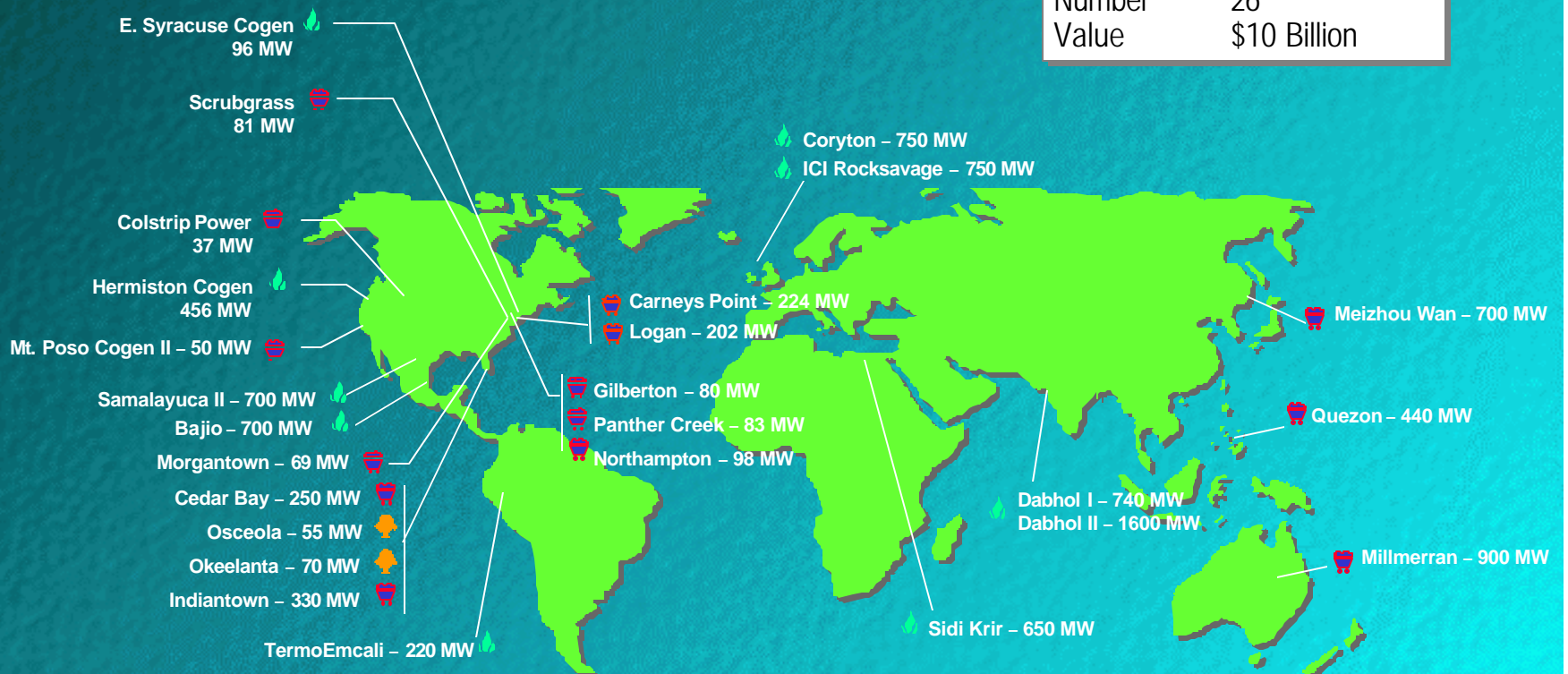
Bechtel Power EPC / CM... Projects in Operation or Under Construction

Total Plants Operating
and Under Construction
Number: 58
Value (TIC): \$16.3 billion
MW: 22,400



Bechtel Enterprises Power Projects Developed

<u>Total Projects Developed</u>	
Number	26
Value	\$10 Billion



	SYMBOLS	OWNERS
Power	Natural Gas	PG&E
	Coal & Waste-Coal	Bechtel Enterprises
	Biomass, W-T-E	Int'l Generating Co.

