Nuclear, coal enviromental faux pas, plus growing gas demand mean a bright future ahead, right? Well....

A NUCLEAR DISASTER strikes in Japan. News reports tell of toxic mercury deposits in fish in northern Wisconsin Lakes originating from inadequate scrubbing facilities on grandfathered coal-fired electric plants in northern Illinois. The electric companies who own them are fighting efforts to replace these outdated units. Together, these environmental faux pas of coal and nuclear make oil look great by comparison. Natural gas is a white knight.

Plus, the **Gas Research Institute** estimates that natural-gas demand will reach 30 Tcf/year by 2015. The **Petroleum Research Council** says in a current ongoing study that 30 Tcf/year milestone is 5 years closer and will arrive in 2010. By 2015, says the PRC, US demand will stand at 32.9 Tcf/year, up from today's 22.4 Tcf/year.

Now all this should point the way toward a healthy, happy natural-gas drilling and production industry in North America.

Right? Well, maybe. The industry, after years of neglect, the 1997-98 spike notwithstanding, is ill-prepared with equipment and personnel to match the growing appetite for this environmentally friendly fuel. Even worse, the reserves aren't there long term, at least not in the US.

So say the experts, speaking at the '99 IADC Annual Meeting. Tackling the issue of waning reserves, **George Littell**, Partner with the noted Houston analyst firm **Groppe, Long & Littell**, stated flatly, "By 2005, the biggest gas producer in the United States is called Canada.

"There is no 30 Tcf gas industry in the United States."

Mr Littell said, that while the industry would continue to shrink, we can expect another drilling boom, as natural-gas prices rise in response to tightened supply. The question, then, he says, is "When does the counterattack start from the consuming side?"

Mr Littell's forecast for major gas producing areas in North America indicate that Gulf of Mexico gas production has already peaked at about 15.5 Bcf/day in 1997. He noted that deliverability in the Gulf, however, is highly dependent upon the federal leasing policy. Deliverability in the Gulf will decline steeply from then on, falling to only about 9 Bcf/day by 2005. Similarly, deliverability in other major areas, including South Texas, Oklahoma and South Louisiana will also drop significantly. While South Texas deliverability peaked in 1998 at about 7.5 Bcf/day, South Louisiana has been declining steadily since the mid-70s, while Oklahoma deliverability peaked at about 6 Bcf/day in 1990. Smaller gas-producing areas, such as west New Mexico, Wyoming and West Texas, are also on the decline.

Noted **John Cochener**, Principal Analyst-Resource Evaluation for GRI, US drilling will grow from 24,000 wells currently to 35,000 in 2015, the year the agency predicts demand for natural gas will reach 30 Tcf. Drilling expenditures will rise from about $16.4 billion to $24.4 billion by 2015.

Mr Cochener is confident the industry will rise to the challenge.

"This projection does not require heroic growth in drilling activity," he said. "As shallow gas depletes, it will be replaced with gas from greater depths."

BOTTLENECK: LACK OF RIGS

Matt Simmons, renowned analyst and investment banker, believes that meeting natural-gas demand won't be quite so simple. He contends that the lack of drilling equipment will prove the bottleneck that will stymie natural-gas demand. "The thing that kills demand is the lack of rigs," he said. He noted that in 1997 he said the industry would need 400 new rigs by 2007 to meet rising demand for hydrocarbons. Due to the sharp and unexpected '98-'99 downturn, an increase in drilling capacity of that scale would now prove impossible, he said.

Mr Simmons expressed grave concerns over the state of the drilling industry, calling it the "most volatile, least profitable and least consolidated sector of the oilfield service industry".

Nonetheless, he expects the drilling industry to prosper in the coming years.

"The first decade of the 21st Century will see the largest explosion of drilling activity since the industry began," he said.

Sources of North American gas (Tcf/year)

	1995	2000	2005	2010	2015
US Onshore					
Shallow (<10,000 ft)	9.1	9.2	9.5	9.9	10.9
Medium (10,000-15,000 ft)	3.2	3.8	4.0	4.6	5.4
Deep (15,000+ ft)	0.9	1.0	1.7	3.0	3.2
Total Onshore	**13.2**	**14.0**	**15.2**	**17.5**	**19.5**
US Offshore					
Gulf of Mexico Shelf	4.3	4.1	3.9	3.4	3.1
Gulf of Mexico Deepwater	0.0	1.4	3.2	4.1	4.2
Total Offshore	**4.3**	**5.5**	**7.1**	**7.6**	**7.3**
Total US	**17.5**	**19.5**	**22.3**	**25.1**	**26.8**
Candian Imports	2.2	3.0	4.0	5.0	6.1
Grand Total	**19.7**	**22.6**	**26.3**	**30.0**	**32.9**

Source: Simmons & Co International

The key to ultimate prosperity, though, is to avoid the boom and bust cycles that have also characterized the drilling industry since its birth.

CHASE: SHARP CORRECTION

Len Paton, Managing Director-Global Oil & Gas Group, **Chase Securities Inc**, said the price correction has been sharp, but short—if not sweet—at least relative to the long down cycle that dominated the '80s and most of the '90s.

"Fundamentals of supply and demand have returned to a healthy state," Mr Patopn said. "The industry is poised for a renewed period of growth."

Currently, he said, the hydrocarbon demand curve almost tracks supply. This after a disastrous downturn brought about by the twin engines of increased OPEC supply and the Asian economic crisis, spiced with a dash of El Niño.

As bad as it got, though, Mr Paton says we should be grateful.

"We're really lucky we didn't see less than $10 oil," he said.

Mr Paton explained that not only did demand fall off, but storage facilities were full. The result was that anyone holding oil not only had no customers, but had nowhere to put the commodity until demand beefed up.

Now, thanks to a rebounding world economy, with the US as the principal driver, Mr Paton believes we will enjoy a big "pop back" in oil demand. At the latest, he said, the industry will return to excellent health by mid-2000—assuming OPEC can maintain discipline.

He advised contractors, "Keep contracts short, because better days are ahead soon."

Mr Paton also advised contracts with cash to invest in upgrades. "The best equipment goes to work first," he said.

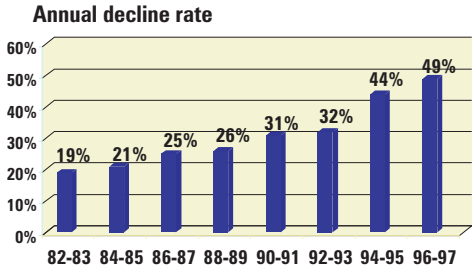
WHENCE THE GAS?

Mr Simmons classed US gas supply into 6 main sources—3 of them onshore, 2 offshore and Canadian imports. US onshore natural gas, he said, would account for 17.5 Tcf/year by 2010, up sharply from 13.2 Tcf/year in 1995 and an anticipated 14.0 Tcf/year in 2000. Shallow (less than 10,000 ft), medium (10,000-15,000 ft) and deep (15,000-plus feet) will by 2010 account for 9.9, 4.6 and 3.0 Tcf/year, respectively (see table).

This scenario calls for deepwater gas to triple from 1.4 Tcf/year to 4.2 Tcf/year between 2000 and 2015, even as GOM Shelf supplies fall by some 25%, from 4.1 Tcf/year to 3.1 Tcf/year.

Similarly, deep gas is set to increase by more than threefold, from 1.0 Tcf/year in 2000 to 3.2 Tcf/year in 2015, the Simmons & Co data predicts. Meanwhile, medium-depth gas must increase by nearly half, to 5.4 Tcf/year in 2015 from 3.8 Tcf/year in 2000. Shallow onshore gas is forecast to increase by about 10%, from 9.2 Tcf/year in 2000 to 10.9 Tcf/year in 2015.

Gulf of Mexico oil & gas production decline



Accelerating decline: It's no secret that decline rates for Gulf of Mexico fields are increasing. What's interesting, as well, is that the *rate* of the decline appears on the rise, too.

Even with these increases, Canadian imports must more than double, from 3.0 Tcf/year to 6.1 Tcf/year in 2015. Because of the increasing specter of depletion, this effort will put enormous pressure on Canadian gas supply to meet the demands of Canadian consumption and rising exports to the US. This means the Canadian industry must supply 9.9 Tcf in 2015, 3.8 Tcf of it for internal use. Current production is about 5.7 Tcf, Mr Simmons said, and to meet internal consumption alone in 2015, while combating depletion, will require replacing 4.3 Tcf.

"They have to double production because of depletion," Mr Simmons said, "not just to add 4.3 Tcf [to meet demand]."

The lurking specter of depletion is also critically affecting oil supplies, not just gas, Mr Simmons said. Non-OPEC supply has flattened out, he said, despite virtual 100% rig utilization during 1997-98. Furthermore, E&P costs of the 20 most efficient producing companies, combining spending for acquisitions, exploration and development, rose from $39.2 million in '96 to $47.2 million in '97 and to a staggering $59.0 million in 1998. That's a 50% increase in just 2 years. In truth, most of the increase owes to increased acquisition costs, which rose from $5.6 million to $16.9 million, a threefold increase.

Despite the spending increases, though, production is decreasing for these same 20 best-in-class producers. For these firms, total production reached 23.6 MM boe/day in '96, but in '97 and '98, the totals were just 23.3 MM boe/day and 23.2 M boe/day, respectively.

"Clearly the decline rate is accelerating now at a rate we've never experienced before," Mr Simmons said.

He said is normally assumed that depletion marches along at some 10% per year. However, Mr Simmons said, anecdotal evidence exists for decline rates closer to 20%.

Meanwhile, world hydrocarbon demand continues to rise, he says. Simmons & Co estimates that total global hydrocarbon demand will increase from 114.0 MM boe/day in '98 to 134.6 MM boe/day in '05 and 152.5 boe/day in '10. This is a 38.5 MM boe/day increase in 12 years.

At these production rates and at 10%/year depletion, Simmons & Co calculates the production decline due to depletion at 82 MM boe from 1998-2010.

Therefore, Mr Simmons concludes, the total production that must be added to both meet increasing demand and replace depletion will total 120 MM boe/day. That's 10 MM boe/day annually.

The only way to meet this intimidating target is with more rigs, Mr Simmons said. He further believes that the world will need over the next decade 900 new land rigs and 100 offshore units *just to replace attrition* in the world rig fleet.

The rig question is central to securing the world's hydrocarbon supplies. As for natural gas in the US, the problem is similarly daunting.

"Creating a 30 Tcf natural-gas market," he said, "is more complex and costly than putting a man on the moon."

Still, while the challenges are daunting, Mr Simmons is generally upbeat. "It could," he remarked, "be the best decade you've ever faced."