



their teeth in foreign R&D shops will return to Chinese companies or launch their own ventures to control intellectual property rights.

A central challenge for Chinese pharma is a paucity of new ideas. "China does not have its own drugs" according to the definition that a compound has a known structure and a proven efficacy, claims Lu. He and others argue that Chinese drug firms have been content with copying medicines or market-

ing what would be called "supplements" in the West that are derived from traditional medicine but are of unproven efficacy.

Nevertheless, the stage is set for a transformation. China has stiffened laws to protect intellectual property. "The situation has improved dramatically," says Zhang.

"A Chinese company today cannot risk spending money developing a product if it knows there's a good chance it will be

stopped from producing it later," Mark Engel, president of Excel PharmaStudies Inc. in Beijing, told *Burrill Greater China Life Sciences Quarterly*.

Pfizer and Eli Lilly recently won cases in Chinese courts favoring their patents. "The era of copycats will soon be over," predicts Lu, who says that Chinese pharma companies will go "belly up" if they fail to develop their own therapeutics. **—HAO XIN**

OIL RESOURCES

Even Oil Optimists Expect Energy Demand to Outstrip Supply

There are at least a trillion barrels of oil left in the ground to feed the world's appetite for liquid energy, maybe 2 or 3 trillion. Forecasters disagree about when drillers will first fail to deliver all the oil the world wants. Some say that crisis will come in the next decade, some by midcentury. Last week, a federally commissioned report warned that, although the world is not running out of oil, the United States must ambitiously develop additional sources of liquid energy in the next 25 years. Oil alone will not suffice. And a second recent report foresees oil supplies tightening by as early as 2010.

A root problem, everyone agrees, is the rapidly growing demand for energy. Last week's report (www.npc.org) from the federally chartered National Petroleum Council (NPC) starts with the prospect of a 50% to 60% increase in demand for oil by 2030. That's about the percentage by which world production has increased in the past 25 years. But meeting increased demand will be harder this time. The volume of oil required will be 35% greater than what was produced in the previous 25 years; that's more oil than consumed throughout human history up to 2005. And the easiest oil to extract has by now been produced.

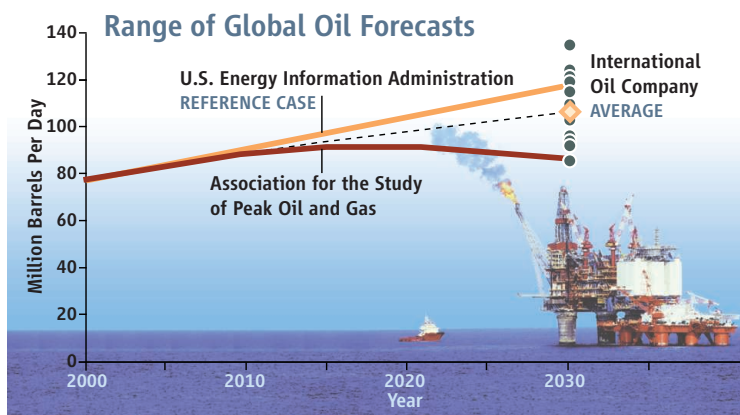
The NPC report committee—headed by Lee Raymond, retired chair of Exxon Mobil—compiled forecasts from a dozen energy consulting firms and international oil companies. The forecasts span a range from about 80 mil-

lion barrels per day in 2030 to about 135 mb/d (see figure). All but one fell short of meeting the expected 50% demand increase. The average of the dozen fell 10 mb/d short of the U.S. Energy Information Administration's forecast for 2030. And the lowest oil company forecast in the study equaled that from the

what remains, political instability in countries such as Nigeria, reluctance or inability to extract oil faster in places such as Mexico and Venezuela, and the challenge of assembling the required human and financial resources.

Surprisingly, the 40-page executive summary does not mention OPEC (the Organization of the Petroleum Exporting Countries). Energy analyst David Greene of Oak Ridge National Laboratory in Tennessee sees that as "a huge blind spot" for the NPC. Although he agrees that there's lots of oil left in the world, the lion's share lies under OPEC member countries. Organizations such as "the International Energy Agency [IEA], Exxon Mobil, and others have predicted that by 2010 everybody outside of OPEC will find it almost impossible to increase production," he says, because the remaining non-OPEC oil is not abundant enough.

The IEA re-emphasized that conundrum in its Medium-Term Oil Market Report (omrpublic.iea.org/mtomr.htm) released 9 July. Although a spurt of non-OPEC production will bring some relief over the next couple of years, the report says, by 2012 the oil market will be "extremely tight" as planned OPEC and non-OPEC production fail to stay ahead of rising demand. "It is abundantly clear that if the path of demand does not change on its own [by 2011]," says the report, "it may well be driven to change by higher prices." **—RICHARD A. KERR**



Lower expectations. Oil companies tend to forecast that oil production in 2030 will be below the official U.S. forecast but above pessimists' prediction.

Association for the Study of Peak Oil and Gas, which shows world production peaking by 2015 and then starting to decline by 2020 in a crisis of global proportions.

Given such relative pessimism within the oil industry, the NPC committee concluded that "it is a hard truth that the global supply of oil and natural gas from the conventional sources relied upon historically is unlikely to meet projected 50-60 percent growth in demand over the next 25 years." There's probably enough oil in the ground, the NPC says, but there are other, more important constraints: the technical difficulty of extracting