HOUSTON'S CHALLENGE

Needed: A plan to keep title of energy capital

Oil patch will have to adjust to meet changing global demands

By RICHARD SMALLEY, AMY MYERS JAFFE and WADE ADAMS

HOUSTON is the energy capital of the world. Approximately 5,000 energy-related establishments are located here, including more than 400 exploration and production firms, more than 30 pipeline operators and hundreds of manufacturers of energy-sector products. Forty-eight percent of Houston's economic base is related to energy.

Serving as the world's energy capital offers a strong basis for the future. Global demand for energy will grow dramatically in the coming decades, particularly as economies expand in the developing world, creating more need for automobile fuels and electricity. The world will look to Houston for vision and innovation in meeting this rising demand.

The question is: Can Houston continue to deliver?

At present, oil and natural gas-based businesses represent the core of Houston's energy sector. This emphasis makes sense today because oil and gas represent more than half of the energy used to meet the world's primary energy requirements. This is unlikely to change any time soon. But over the longer term, investment in alternative fuels and technologies will increase substantially.

Major cities, states and nations are establishing laws that target how much energy must be produced from renewable resources. In Texas, our goal is to have 2,000 megawatts of energy produced from renewable

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ENERGY: Will city's future be in new technologies?

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sources by 2009. California aims to have 20 percent of electricity provided by renewable energy resources by 2017. Even China, with the highest energy-use growth rate in the world, has set a target of 10 percent renewable energy by 2010. Clean Edge, a California research firm, predicts spending in renewable energy will jump to $89 billion by 2012 from $10 billion today.

Seventeen states have established renewable-energy funds that are propelling exciting entrepreneurial energy companies such as solar energy firms. These states include Arizona ($25 million a year), Massachusetts ($20 million a year) and California ($135 million through 2012). Houston and Texas are conspicuously absent from this list.

For Houston to remain at the cutting edge of the energy business, it must consider how to position itself as the major player in new energy technologies, not just technologies for oil and gas extraction. Otherwise, the city will find that other U.S. or international energy venues will emerge, perhaps better positioned to compete in the changing worldwide energy business.

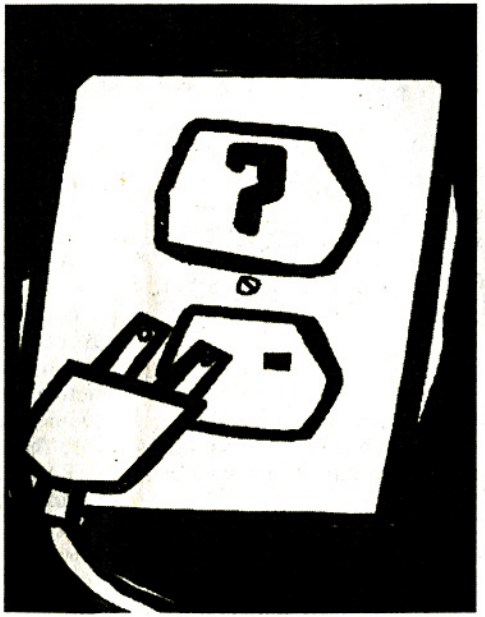
Today, hundreds of millions of federal dollars are being distributed for energy technology-related research. These dollars should be coming to the Houston region. Instead, they are increasingly going to places like California and Wyoming.

Despite Houston's position near major coal resources and a giant electricity industry, two major national clean-coal pilot projects have been established in other localities. National hydrogen and fuel cell initiatives are also based elsewhere. Houston has also failed to emerge as a center for wind energy technology despite early successes in Texas.

Houston is well-positioned to lead the way in energy science and technology. One important step is to recognize the potential for nanotechnology for the energy industry — including breakthroughs in enhanced hydrocarbon extraction, carbon sequestration, hydrogen technologies, renewable energy, and innovative hardware and software for distributive generation.

Houston and Texas should be developing a coherent and aggressive agenda to attract new energy businesses to its economic base and to increase funding for fundamental research in energy science and nanoscale energy work, both in the private sector and at local academic institutions. To secure its position in future energy, the city needs to stand out as a center for innovation in energy technology as it does in the medical field.

The public policy framework for our future role as the energy capital is critical. Houston needs tax incentives and other drivers to direct investment in future technologies. It should also expand the research and development infrastructure of the area and promote institutions that link businesses to technology. It should create frontier science research funds and become a leader in seeking state and federal funding for energy innovation. It needs to support more assertively promising initiatives such as the Texas Advanced Research Alliance for Nanostructured Energy Systems. It should prominently host international energy technology and innovation meetings.



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In short, through actions and words, Houston needs to be the most visible, proactive innovator in world energy: the energy capital now and in the future.