

# A green dream in Texas

**RICHARDSON, Texas** When it comes to energy and the American people, George W. Bush and Dick Cheney are guilty of the soft bigotry of low expectations.

No one has lower expectations for the American people than a vice president who thinks "conservation" is simply a personal virtue, not a national security imperative, and a president who can barely choke out the word.

But Americans are starting to lead themselves. The most impressive project I've seen is by Texas Instruments, which is building a "green" chip factory here in Richardson, near Dallas. TI is keeping 1,000 high-tech jobs in Texas by building its newest facility — to make wafers used in semiconductors — in a cost-saving, hyper-efficient green manner.

TI always wanted to keep its newest wafer factory near Dallas so it would be near its design center and ideas could flow back and forth. But China, Taiwan and Singapore were all tempting alternatives, offering low wages, subsidies and tax breaks.

So the TI leadership laid down a challenge: TI could locate its new wafer factory in Richardson, if the TI design team and community leaders could find a way to build it for \$180 million less than its last Dallas factory, erected in the late 1990s. That would make its cost-per-wafer competitive with any overseas plant's.

Although the TI engineers initially thought it impossible, they pulled it off. Previous chip factories had three floors because of the complicated cooling and manufacturing process involved in making wafers. The TI design team came up with a way to build the Richardson factory with just two floors — a huge savings in mass and energy.

TI also contacted Amory Lovins, the green designer who heads the Rocky Mountain Institute, and asked him to help it design other parts of the plant in a way that would lower its resource consumption, which, over the life of a plant, can exceed construction outlays.

Together, TI engineers and Lovins' team designed big water pipes with fewer elbows, which reduced friction loss and let them use smaller pumps that save energy. Various passive solar innovations were built in, including

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## Green building is the next industrial revolution.

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roofs that use a white reflective coating to reduce heat.

These, together with innovations in how air is circulated, cooled and recovered naturally, reduced total heat so much that TI was able to get rid of one huge industrial air-conditioner. Almost all of the waste from the building construction is being recycled. The urinals are all waterless.

"Green building is not necessarily about producing your own power with windmills and solar panels. It's about addressing the consumption side with really creative design and engineering to eliminate waste and reduce energy usage — it's the next industrial revolution," said Paul Westbrook, who oversees sustainable design for TI and helped turn TI leaders on to green building by taking them to his solar-powered home.

"Green building added some cost, but overall we built a green building for 30

percent less per square foot than our previous conventional facility." This is expected to cut utility costs by 20 percent and water usage by 35 percent.

To entice TI to build again in the Dallas area, the University of Texas, the state legislature and private sources put up \$300 million for a 10-year effort to improve science and engineering studies at the University of Texas in Dallas, so TI will have plenty of educated workers.

"We are proud to prove on a global basis that you can [be] green and energy-sensitive and reduce costs and increase profits," said Shauna Sowell, TI's vice president for worldwide facilities.

America can keep good manufacturing jobs, she added, "but we cannot do it the same way we've been doing it. We have to do it differently. I think you do first have to set an impossible goal. Amazing things happen when people claim responsibility for creating the impossible."

They sure do. In 1961, when President John F. Kennedy called for putting a man on the moon, he didn't know how — but his vision was so compelling, his expectations of the American people so high, that they drove the moon shot well after he died. The Bush-Cheney team should be inspiring our generation's moon shot: energy independence. But so far all they've challenged Americans to do is accept a tax cut.

So hats off to the leaders of TI. Thanks to their vision, Dallas — not China — has the newest TI wafer plant, a new investment in education and a great example of how a green factory can be efficient and profitable and can create good American jobs in the 21st century.

Energy guzzling is for defeatists. Real Americans — and real Texans — build green.