

GLOBAL WARMING,  
ELECTRIC POWER,  
AND IBEW 1245

*“Everybody complains about the weather,  
but nobody ever does anything about it.”*

Mark Twain

SECOND IN A SERIES

# Are we cooked? Not yet! Energy efficiency offers new hope in fight against global warming.

*People will always be glad to see the electric lineman outside restoring their power, or the gas serviceman coming in to relight their pilot. But as global warming changes the way we think about energy, people are going to be happy to see Sean Folks, too.*

**B**lackouts are not an option in today's world. Not if we need lights, refrigeration, computers, communications or the internet. Which we do.

So when the demand for power exceeds supply, we have two options. Generate more power. Or use our existing supply more efficiently.

Here's the good news. Using our existing supply more efficiently is cheaper than building new power plants. It enables us to maintain our standard of living without adding to global warming. And it is largely achievable

IBEW member Sean Folks inspects the weatherstripping installed by contractors for PG&E's low-income weatherization program.



using existing technology.

Efficiency is not a new concept. It's also called eliminating waste. Our grandparents considered it just plain common sense. Efficient use of resources is a deeply “conservative” principle, one that Americans valued in the past and will value again as the world gets warmer and the weather gets weirder.

For many decades, utilities have met America's need for power by generating electricity. IBEW members have provided the feet on the ground to get that power generated and distributed. But going forward, if we want to avert the harshest consequences of global warming, utilities will need to help their customers get more use out of the power that is already generated.

Meet Sean Folks.

*continued on page 6*

## Are We Cooked?

continued from page 1

### Like Money in the Bank

Sean Folks is the sort of guy you'd invite inside for a glass of lemonade. On a warm June day in Walnut Creek he's wearing shorts, a PG&E baseball cap and a smile that says, "I'm here to help."

The customer, a retired woman named Bonnie, just had her home weatherized under a PG&E-subsidized program. Folks, an inspector with PG&E's Central Inspection Program and a member of IBEW Local 1245, has arrived to make sure the job was done right and that nothing was overlooked.

For Bonnie, the program is like money in the bank. Folks isn't handing her an actual check, of course. But he's making sure that she doesn't spend one penny

more than necessary for the gas and electricity she uses for heating, cooling, lighting and household appliances.

Folks checks the new weatherstripping around the door, the new compact fluorescent bulbs in the light fixtures. He examines the furnace and the hot water heater, with an eye to safety as well as energy efficiency.

Before he's done, he's inspected every part of the house where energy could be lost. But there's one last stop on the inspection tour: the new insulation in the attic. His friendly smile disappears behind a Darth Vader respirator and soon he's crawling around in the dark aiming a flashlight into every corner of the attic.

"We're helping people and we save en-

*Much of the energy that America pumps into its buildings for heating and cooling just leaks right out again. This makes about as much sense as pouring water into a bathtub without bothering to put in the drain stopper.*

ergy," Folks says later, summing up why he feels pretty good about his job—most of the time.

"I just don't like attics and crawl spaces—especially if anything moves in either one."

### Leaky Buildings

In all, Pacific Gas & Electric provides free weatherization services to about 60,000 low-income customers a year.

It's one piece in a larger program to address a major problem:

Much of the energy that America pumps into its buildings for heating and cooling just leaks right out again. This makes about as much sense as pouring water into a bathtub without bothering to put in the drain stopper. The problem is compounded by appliances that use far more energy than necessary to get the job done.

The threat of global warming has lent new urgency to the problem of leaky, inefficient buildings. Taken together, the heating, cooling and lighting of buildings accounts for about 30% of the world's greenhouse gas emissions. Approximately 43% of US carbon dioxide emissions result from the total energy services required by residential, commercial and industrial buildings.

That's an enormous load of carbon dioxide going into the atmosphere—where it traps sunlight, heats the planet, and threatens to deliver a rising tide of disasters to human communities worldwide.

The good news is that we are surrounded by solutions. A variety of efficiency measures, taken together, could avoid 23% of the carbon emissions that US buildings are expected to produce in 2025, according to researchers at the Oak Ridge National Laboratory.

These measures include low-income weatherization programs, like the work

inspected by Sean Folks. But they also include setting higher standards for energy efficiency in new buildings.

### The Power of Efficiency

From the outer shell, to the appliances inside, to the use of daylight for illumination, our buildings can be fixed. It's not quite as easy as remembering to stick the stopper in the bathtub drain, but it's a lot less complicated than putting a man on the moon or designing an emissions-free coal-fired power plant.

The US Green Building Council recently reported that structures built to its standards, using available technology, can cut energy use 20 to 80 percent. A study by the American Council for an Energy Efficient Economy, released in June, found that energy efficiency measures could enable the state of Florida to cut electricity demand by 19.9% by 2023, with a savings to the state of \$28 billion.

Such projections are given additional weight by actual demonstrations of the power of energy efficiency:

In the 1990s PG&E built a new suburban tract house in Davis, CA that could stay cool in the summer without air-conditioning. PG&E estimated that such a design, if widely adopted, would cost about \$1,800 less to build and \$1,600 less to maintain over its lifetime than a conventional home of the same size.

In 1996 a Thai architect built a house that required only one-seventh the air-conditioning capacity usually installed in a structure of that size, and used the savings in equipment costs to pay for insulating the house's roof, walls and windows.

In 1997 the designers of a carpet factory in Shanghai cut the pumping power required for a heat-circulating loop by 92% simply by installing fat pipes rather than thin ones, and by laying out the pipes before positioning the equipment

Story & photos by Eric Wolfe

### Central Inspection Program



Darth Vader? No, Sean Folks, inspecting insulation recently installed in a customer's attic.

### Coping with cat fur and the little green man

When Sean Folks is inspecting the weatherization work performed by PG&E contractors, he sometimes sees things that would otherwise go unnoticed.

Inspecting a home in Walnut Creek, for example, he peeks behind some appliances and spots an old gas line with a valve.

It is clearly no longer in use, but it has never been capped.

"You get kids back there turning that thing and you could have a big prob-

lem," he tells the customer. He makes a note to have a gas serviceman come take care of it.

"Customers don't pay attention to that stuff, so we look for it and get it fixed," Folks says.

Rummaging around in the hidden spots of people's homes, going through their closets, can be awkward. It highlights the value of customer contact skills.

"It's always somewhat uncomfortable for people to have strangers in their house. I try to smile, be friendly," says Folks. "If they have a dog, I talk about their dog."

Sometimes those people skills get tested to the max. Folks recalls performing a pre-inspection on a house populated by a woman, her sister, and about a million cats.

"There was a thick mat of fur on everything. You couldn't see the floor. The smell was horrible."

He soldiered on, checking all the appliances, crawling under the house to check the furnace. As he was completing the job he took comfort in knowing that he only had one more house to do that day. It happened to be right next door.

One of the women in the house of cats walked out with him. The house next door was hers.

"Oh no," Folks thinks. And sure enough.

"It was the same thing, cats everywhere, fur everywhere."

Another customer once detained Folks at length, telling him about "the little green guy living under the house."

"It's an interesting job," says Folks. "You meet a lot of 'unique' people."

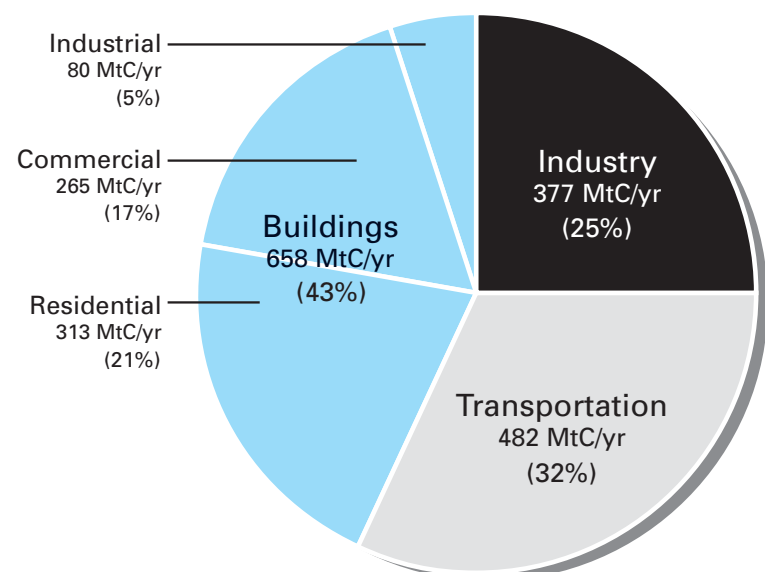
But cat fur and little green men haven't quenched his enthusiasm for improving the efficiency of people's homes.

"It is a great program. We ought to do that everywhere."

"It's always somewhat uncomfortable for people to have strangers in their house. I try to smile, be friendly," says Sean Folks.



### CO2 emissions from fossil fuel combustion by end-use sector, 2002. (MtC/yr=million metric tons of carbon)





they connect, thereby creating shorter, more direct pathways.

These examples, cited by Amory Lovins in a recent issue of *Scientific American*, illustrate how “whole-system engineering” of residential buildings and industrial facilities can reduce energy use without reducing our creature comforts.

Whole-system engineering will have little impact on carbon emissions, of course, if it is not widely adopted by the building industry. Lovins, an energy consultant in demand around the world, suggests two ways utilities can help bring this about: Give rebates to designers according to how much energy they save. And experiment with sliding scale hookup fees “so when you go to connect your new building to the grid, you pay a fee or get a rebate according to how efficient or inefficient it is compared to the norm.”



Energy efficiency expert Amory Lovins met with the Utility Reporter during a visit to the Bay Area in June that included this stop at Google's campus in Mountain View.

## Incentives Gaining Traction

Incentives are already available for designers and owners in California under “Savings by Design,” sponsored by the Public Utilities Commission, PG&E, SMUD and other utilities. Design teams who achieve energy efficiency 15% bet-

ter than California Title 24 building standards are eligible for incentives up to \$50,000. Owners are eligible to receive a separate set of incentives worth up to \$150,000 based on energy savings.

Incentives for efficiency are gaining traction with utilities throughout the state. Among other IBEW-represented utilities, for example:

Roseville Electric offers rebates to builders who can beat California's Title 24 building standard by 10% or more, and provides numerous efficiency incentives for existing homes, including rebates for energy efficient lighting, air conditioning, sun screens, windows and pool pumps.

The City of Redding's Electric Utility aims even higher. It's Earth Advantage program targets certain rebates to builders who exceed Title 24 building standards by 20%. The City thought the program might attract three or four builders, but over a dozen have signed up.

Last year, 65% of new homes built in Redding received the EA designation, and there are 350-450 such homes in the pipeline now. IBEW Local 1245 members at the utility are among those who have signed up for benefits under the program.

## Shaving Peak Demand

On a hot August day IBEW Local 1245 member Bob Karle is providing the legwork for another utility program that helps fight global warming.

“OK,” says Karle, peering up at a modest home on Baxter Ave. in Sacramento. “This one's on the roof.”

What Karle has spotted is the customer's air conditioner. He pulls his ladder from the truck and gathers up his tools. Time to save the world.

Karle wouldn't put it that way, of course. The 27-year member of IBEW Local 1245 is just doing the same job he's been doing for over two decades: helping the Sacramento Municipal Utility District shave peak demand.

In exchange for getting reduced bills during the high-demand months of June through September, residential customers can volunteer to let SMUD briefly turn off their air conditioners by remote control during times of peak usage. This



Bob Karle reconnects a radio-controlled cyclor on the air conditioner of one of SMUD's participating customers.

*Studies cited by the Electric Power Research Institute (EPRI) suggest that demand-response programs have the potential to save 10-20% of peak load.*

targeted “outage” is cycled through the system so that any particular customer experiences only a brief interruption of their AC service.

The radio-controlled shut off device is installed right on the air conditioner. After speaking with the customer, Karle locates solid footing for his ladder in the backyard. Once on the roof, he discovers that the radio device is already installed, but has been disconnected at some point in the past.

“Probably by someone up here servicing the air conditioner,” Karle speculates. He re-wires the device to the unit and runs a test to make sure it can receive the radio signal.

The SMUD “cycling” program is not an energy efficiency program properly speaking. Energy efficiency is achieving the same level of service with less energy input. Air conditioner cycling is a “demand-response” program that can involve reduced service to the customer.

But the benefits of being able to shave peak demand far outweigh the inconvenience to customers, making AC cycling an important carbon-reduction tool. Studies cited by the Electric Power Research Institute (EPRI) suggest that demand-response programs have the potential to save 10-20% of peak load.

In SMUD's case, the utility can turn to its customers for up to 150 megawatts of energy in the form of reduced demand, and avoid the cost of building additional generating capacity.

SMUD tests the system periodically to see how much load they could, in fact, shed.

“They want to make sure these things are working properly,” says Robert Henderson, a Senior Electric Tech with the program and a 16-year union member.

Henderson says the amount of money customers save on their bill “isn't enough to drive anybody to the program.” Doing something for the environment is what motivates the vast majority of the 100,000 participants, he believes.

There's a bonus to having IBEW members visiting people at their homes, says

## It can get a little weird

Any SMUD Electric Technician confirms this: it can get a little weird out there.

“Our equipment is outside, but sometimes we have to backtrack it which puts us inside the house, which is where you encounter some unusual things,” says Bob Sanchez, Senior Electric Tech.

Bob Henderson, also a Senior Electric Tech, elaborates: “One house was covered on the inside with aluminum foil because the customer thought ‘they’ were beaming some kind of rays at him.”

Then there are the “not necessarily friendly dogs.”

“We've had guys end up in the swimming pool,” says Henderson.

Actually there are a number of animals who might show up unexpectedly while you've got your nose buried inside a customer's AC unit.

“Pigs. Geese. Geese are not friendly,” says Henderson.

Sometimes things begin to seem a little too friendly. “Free-spirited sunbathers,” Henderson explains.

The AC units where Electric Techs spend a lot of their time can house an assortment of unexpected guests.

“Wasps,” says Sanchez. “Venomous spiders. A rattlesnake coiled inside the unit.”

Responding to a customer who reported a problem with their AC, you might find “a lizard fried on the unit,” Sanchez says.

“There's your problem!” Henderson says.

Leaving the wild kingdom aside for a moment, just dealing with the customers can keep you guessing, says Bob Karle.

“One job they'll invite you in to breakfast. You go to the next house and they might be mad at SMUD and kick you off the property.”

After 27 years on the job, Karle is philosophical. You're dealing with customers whose AC is out. Sometimes it's very hot outside.

“People are upset. You just have to deal with it. You can't please everybody,” he says.



Bob Karle begins to open up a customer's air conditioner. Sometimes there are surprises inside.



Servicing SMUD's air conditioner cycling program are, from left: John Parnell and Charles Mann, Electric Tech IIs; Robert Sanchez and Robert Henderson, Senior Electric Techs; Tom Young and Robert Karle, Electric Tech IIs. Not pictured: Josue Rios and Barry Rumpf, Electric Tech IIs.





## Combating carbon: do the numbers add up?

In Part I of this series, the Utility Reporter laid out the dynamics of global warming:

People are releasing ever-increasing amounts of greenhouse gases. As the concentrations of these gases build up in the atmosphere, they trap heat from the sun. As temperatures climb, sea ice melts, ocean levels rise, and the weather becomes more extreme.

Humans in the 21st century will face worsening forest fires, storms, and flooding, as well as threats to our food and water supplies.

To minimize these threats, NASA's top climate scientist, James Hansen, believes we need to limit additional global temperature rise to no more than 1 degree Celsius (nearly 2 degrees on the familiar Fahrenheit scale), compared to temperatures in the year 2000. To achieve that limited rise, we will have to cap the amount of carbon dioxide in the atmosphere at 450 to 500 parts per million.

What do these numbers mean in terms of what we must actually do?

According to the best available data, to achieve the needed worldwide reductions in carbon emissions, the industrialized countries must reduce emissions by about 60% to 80% below today's values by the year 2050. This means that by the year 2030 we would already need to have achieved reductions of 33% to 44% below today's carbon emission levels.

To get to this level by 2030, our carbon emissions from fossil fuels would have to drop from their current level of 1.6 billion tons/year to about 1 billion tons/year in 2030. Accounting for expected economic growth and associated increases in carbon emissions in a "business-as-usual" scenario, in the year 2030 we need to be displacing about 1.2 billion tons/year.

Here's the \$64,000 question: Is there any way on God's green earth that these reductions can be accomplished?

In a report released earlier this year, some of the nation's top experts in energy efficiency and renewable energy say, "Yes, it can be done." Approximately 43% of their projected reductions would come from tapping renewable energy sources. The other 57% would come from energy efficiency measures. Their report is available on-line at [www.ases.org/climate-change/climate\\_change.pdf](http://www.ases.org/climate-change/climate_change.pdf).

Report editor Chuck Kutscher said, "All we need is a national commitment to do it, and the courage to act now."

Henderson. It gives them an opportunity to inform customers about SMUD's other energy efficiency programs: shade tree, solar electric, solar water heating, and lighting rebate programs, for example.

"We're very environmentally friendly," he says.

For customers enrolled in the program, it's a painless way to save money as well as energy. The cycling program hasn't been activated to shut off people's air conditioners since 2001.

### Profiting from Efficiency

Demand-response programs like AC cycling can be found at utilities around the country. But utilities have been slow to embrace energy efficiency, despite its proven power to reduce demand and combat global warming.

The reason is simple: All 50 states permit utilities to earn a profit from electric generation. But only two states—California and Idaho—allow utilities to earn a profit from promoting efficiency.

California created opportunities for utilities to earn money on efficiency programs beginning in the early 1990s. But those financial incentives withered on the vine as California policymakers became intoxicated by electric deregulation in the mid-1990s.

Enron promised that competitive markets would provide cheap, reliable sources of power, and regulators and legislators were all too easily deluded. The mirage was dissipated by the catastrophic 2000-2001 energy crisis, and regulated utilities like PG&E were once again given the responsibility of procuring energy resources for California. But rewarding efficiency was not part of the mix.

Finally, in 2005, the conversation about efficiency resumed between regulators and utilities, leading to a break-

*All 50 states permit utilities to earn a profit from electric generation. But only two states—California and Idaho—allow utilities to earn a profit from promoting efficiency.*

### "A near-complete transformation"

"If climate policy is to achieve the current internationally agreed-upon goal of stabilization of concentrations of greenhouse gasses in the atmosphere, a near-complete transformation of the energy system will ultimately be required—from a global energy system that is 85% CO<sub>2</sub>-emitting today to one that is predominantly non-emitting. This will not be possible without substantial contributions through energy efficiency.

*Electric Power Research Institute Journal, Summer 2006*

through program that could receive final approval by the CPUC as early as this month.

The proposal, written jointly by CPUC Commissioner Dian Grueneich and Administrative Law Judge Meg Gottstein, offers incentives to ratchet up energy efficiency initiatives by Pacific Gas & Electric, Southern California Edison, San Diego Gas & Electric and Southern California Gas Company. Utility rate-payers and shareholders would reap financial rewards if the utilities meet their efficiency goals set for 2006-2008. However, shareholders would have to absorb financial penalties if utility performance falls below 65% of the goal.

"PG&E management now has a robust financial incentive to go after every kilowatt hour of savings not now being achieved," says Ralph Cavanagh, co-director of the Energy Program of the Natural Resources Defense Council.

Cavanagh believes there are "plenty of untapped opportunities" for efficiency improvements in both existing as well as new buildings and equipment. "What this new system encourages PG&E to do is to think big on energy efficiency," he says.

The California plan is performance driven, going a step further than an efficiency program in neighboring Nevada, for example, which offers incentives based on the amount of money a utility spends on efficiency, regardless of actual results.

### Embracing the Challenge

PG&E seems eager to embrace the challenge. The company already has 81 different energy efficiency programs spanning all market sectors.

Unfortunately, achieving energy efficiency is not a one-size-fits-all process, according to Roland Risser, PG&E's Director for Customer Energy Efficiency.

"What we've found is that if we build a program and try to market it to customers, it's a hard match. But if we learn customers' businesses very well then we can design programs that fit their

*"PG&E management now has a robust financial incentive to go after every kilowatt hour of savings not now being achieved."* —Ralph Cavanagh, Natural Resources Defense Council

business needs," Risser says.

PG&E tries to focus on market segments that have similar energy needs and then design programs around them. Among the target markets are agriculture and food processing, hospitality and lodging, health care, biotech, high tech, large commercial and institutional, manufacturing and heavy industry, retail, and schools.

Its size gives PG&E the leverage to get energy efficient products into circulation. Through financial arrangements with manufacturers and distributors, the utility expects to put over 20 million compact fluorescent bulbs into customers' homes and businesses between 2006 and 2008.

Compact fluorescent bulbs are just one bright idea in a much larger vision of efficiency. PG&E wants to spread the gospel of efficiency wherever it can accomplish the most savings.

One highly visible target: California's energy-hungry hi tech industry. The utility is targeting rebates not only to the buildings used by hi tech firms, and to infrastructure like air conditioning, but also to "virtualization"—software that can increase the energy efficiency of computers and servers by up to 80%.

But will businesses respond to the call? Risser believes that California's landmark global warming law, AB 32, is going to make California firms far more receptive to energy efficiency opportunities.

AB 32 requires that California's global warming emissions be reduced to 1990 levels by 2020, and mandates an enforceable statewide cap on global warming emissions, to be phased in starting in 2012. The California Air Re-



### CPUC rules establish rewards, penalties

The California Public Utilities Commission ruling expected in September would set up a mechanism to reward or penalize utilities based on energy-efficiency savings.

If the utility doesn't perform to the standard, shareholders have to pick up the cost. If the standards are met, however, shareholder benefit along with customers.

Shareholders would earn 9% of the net benefit if the utility meets 85% of the commission's target. "Once we break 100% of the goal, we get an increase—to 12% of the net benefit, and it stays at that amount," says Roland Risser, Director for Energy Efficiency.

Penalties could total \$144 million for all utilities combined over the three years if performance only reaches 50% to 65% of the goal, or \$238.5 million for reaching less than 50% of the goal.

A so-called deadband range—achieving between 65% and 85% of the goals—would garner neither benefits nor penalties.



sources Board is charged with developing regulations and establishing a mandatory reporting system to track and monitor emissions levels.

California businesses, “are going to need to reduce their carbon footprint,” says Risser. “Anything they can do, such as replace a motor—they’re going to be looking at it in a totally different way” than before.

## Automated Metering

California businesses aren’t alone in needing to look at things in a “different way.” The transformation now getting underway in California’s approach to energy will inevitably affect the workers who deliver it.

You don’t have to look any further than meter reading to see that major changes are on the horizon. The virtues of automated metering are being touted loudly by PG&E and across the utility industry.

Automated meters, coupled with new variable rates, in theory could give customers the information they need to shift energy use away from times of peak demand, when rates will be high, to times of non-peak demand, when rates will be lower.

Proponents of the technology envision a time when an automated meter is even smart enough to diagnose problems. If your refrigerator, for example, suddenly starts using more energy—a sign that a compressor could be failing—the utility could offer to send a serviceman out to inspect it.

Earlier attempts by PG&E to automate meter technology have not succeeded, and the current “Smart Meter” initiative has encountered its share of obstacles. Most recently, after deploying about 20,000 meters that use power lines to transmit data, PG&E revealed it is now

*Even the union has implicitly acknowledged that meter readers’ days are probably numbered and has worked with PG&E in recent years to fill meter reader vacancies with temporary rather than regular employees.*

considering a different technology.

Getting the system deployed is one problem. Living with the result could be another. IBEW meter readers can easily spend the better part of a lunch break telling you the unintended consequences of phasing out the meter reader workforce:

Who will maintain a current library of customer keys and gate combinations so that line crews or other PG&E personnel can gain needed access to customer property? Who will do the surveys for life support and medical stickers? Who will serve as back-up when the automated meter system breaks down? And who will respond when customers call in to complain about wildly wrong reads?

Meter readers have been the utility’s “eyes and ears” on the system, visiting every customer location on a regular basis. They’ve been ambassadors to the communities PG&E serves, enabling customers to see the utility as a service company powered by people rather than a mere logo posted over flavor-of-the-month corporate slogans.

But even the union has implicitly acknowledged that meter readers’ days are probably numbered and has worked with PG&E in recent years to fill meter reader vacancies with temporary rather than regular employees. Heightened concern over energy efficiency may finally give PG&E the political momentum it needs to make the switch to automated metering.

The flip side of the coin is that new jobs will be created, at least temporarily, as PG&E eyes the gargantuan task of installing or retrofitting millions of meters. The union has already conducted extensive bargaining with PG&E over these prospective new jobs in an effort to achieve union protections for those

who perform the work.

The automated meter saga has offered the union an early glimpse of what’s to come as the world keeps a wary eye on global warming and

energy efficiency moves to the head of the line.

## Energy Workforce of the Future

In California, “head of the line” is literally the case. The CPUC requires that energy efficiency comes first in the “loading order” as utility procurement specialists consider how to meet anticipated demand. After efficiency, they must look at demand-response options and then renewable sources, eventually working their way down to conventional power plants.

The energy workforce of the future will feature a growing number of people whose job is to deliver that efficiency.

An analysis by the state’s top energy modelers predicts that achieving 1990 emission levels by 2020 will create up to 83,000 jobs, along with an increase in net income of \$4 billion. A team of U.C. Berkeley economists found that reaching those emission targets could boost the annual Gross State Product by up to \$76 billion, creating as many as 89,000 new jobs.

Some of this work will be controlled by utilities. Of the work utilities control, much will probably be contracted out, just as PG&E currently contracts its low-income weatherization work. Other work could remain in-house, like the inspection work performed by Sean Folks in PG&E’s Central Inspection Program.

There is no guarantee that any of the new work in energy efficiency will be performed by unionized workers. Even the PG&E Central Inspection Program workers were non-union until Folks reached out to Local 1245 Business Representative Landis Marttila to organize a union representation election for the group in 2004.

Global warming is forcing everyone to rewrite the future. Everyone hopes it is a story that does not end with the words, “We’re cooked.”

California lawmakers and regulators wrote the first chapter by authorizing major financial incentives for utilities

to pursue energy efficiency. The utilities are writing the second chapter as they expand existing efficiency programs and create new ones in pursuit of those financial rewards.

A third chapter is needed. It will be about jobs in the new energy efficiency sector. Figuring out what those jobs are going to be and who is going to do them is one of the challenges facing Local 1245 and other utility unions as the world moves into this new, warmer century.

*(Part II in a continuing series)*

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### Incentives Gaining Traction

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### Shaving Peak Demand

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### Profiting from Efficiency

*The reason is simple: All 50 states...* Interview, Ralph Cavanagh, Co-Director of Energy Program, Natural Resources Defense Council, August 2007.

### Embracing the Challenge

*“What we’ve found is that if we build a program...”* Interview, Roland Risser, PG&E Director for Customer Energy Efficiency, August 2007.

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### Sidebar: Combating carbon

*According to the best available data...* “Tackling Climate Change: Overview and Summary,” Page 10, American Solar Energy Association.



## Key Board

Meter Reader Robert Leonard shows some of the keys used to access customer property in San Francisco. Who will maintain this and other key boards and keep them current for customer access if “Smart Meters” replace human meter readers?