

Officials air plans to meld mass transit

Fresno mayor, county leader hope to consolidate bus systems to reduce pollution.

By Barbara Anderson, Jim Davis, The Fresno Bee, September 20, 2002

Together and separately Thursday, Fresno's mayor and the chairman of the county Board of Supervisors pitched plans to clean up the air and improve mass transit in the San Joaquin Valley. At a meeting to discuss streamlining Fresno County mass transit, Supervisor Bob Waterston outlined a consolidation of bus districts that he said would make a better community for his children and grandchildren.

"The selfish part of me is wanting to create an environment where we can keep some of the Waterstons here," the board chairman said.

Waterston had to split time between the transit summit and a monthly meeting of the San Joaquin Valley Air Pollution Control District. He appeared at the air board with Mayor Alan Autry to urge support for a Valleywide clean-air plan.

Autry described his overall vision: Convince the federal government that the Valley is unified in doing all it can to improve its air quality and should be given special status so it can qualify for additional federal funds.

"We have to find a way in the Valley to have clean air and business coexist," the mayor said.

Autry said he will commit one staff member from his office to the clean-air effort and is asking other mayors to assign people.

Waterston and Autry left the air meeting before board members could offer their support -- which they did, directing staffers to investigate the role they can play in helping the mayor and supervisor.

The air district board is composed of elected officials from eight counties -- San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and parts of Kern. Air board members said it was the first time any of them could recall officeholders not sitting on the air board pledging support for cleaning up the air.

Reaction to the mayor's and supervisor's plan wasn't completely positive.

"If Mayor Autry and Supervisor Waterston are serious, then they should withdraw their support for Measure C," said Sierra Club member Kevin Hall, in a statement after the meeting.

Measure C is a half-cent sales tax used to pay for the county's transportation needs. The tax is set to expire in 2007. A ballot measure in November will ask voters to extend it until 2037. Some people oppose the measure, including Hall, who argues it gives too much money to new roads and not enough to mass transit.

Autry and Waterston said they support Measure C.

"Measure C stands fine just the way it is," said Waterston, who was a member of the committee that shaped how money from the ballot measure will be used.

Autry said it doesn't make sense to not build roads, making travel more lengthy and inefficient. "Not supporting Measure C would create more pollution."

Fresno County Supervisor Judith Case, sitting on the air district board, said she was disappointed Thursday's transit meeting conflicted with the air board meeting.

Supervisors called for the transit summit because of concerns about air quality and the efficiency of transit. Three bus districts -- Fresno Area Express, Clovis Stagelines and Roundup and Fresno County Rural Transit -- provide rides for county residents.

"We have independent systems that by and large do not have a long history of working together," said Fresno County Supervisor Juan Arambula.

Waterston also pushed for consolidating transit districts with school bus systems. However, staffers cited problems, including licensing requirements for drivers.

Concerns were also raised about young children riding transit buses with adults.

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Electric mowers recalled

Cordless mowers can overheat, agency warns.

By Russell Clemings, The Fresno Bee, September 20, 2002

More than 2,000 electric lawn mowers that were sold at steep discounts in a San Joaquin Valley Air Pollution Control District program are being recalled because of a fire hazard, district officials said Thursday.

The federal Consumer Product Safety Commission warned that the cordless mowers have an electrical component that can overheat.

With 140,000 such mowers sold to date nationwide, the commission said it has received 11 reports of overheating, with one resulting in a minor hand burn and nine resulting in damage to other property in addition to the mower.

The Valley air district distributed 1,139 of the mowers on three Saturdays in April at events in Visalia, Stockton and Merced, as well as a similar number last year. Buyers paid \$179 for the mower, which normally retails for about \$400. To qualify for the discount, they had to trade in a gasoline-powered mower.

"We were really disappointed in this turn of events," district spokeswoman Josette Merced Bello said. "We were really trying to do something good."

The mowers were sold under the Black & Decker and Craftsman labels. The Black & Decker mowers have model numbers CMM1000 or CMM1000R and date codes from 9534 to 200230. The Craftsman mowers are model number 900.370520. Both types are cordless.

The commission advises owners of the Black & Decker mowers to stop using them immediately and to call Black & Decker at a toll-free number -- (866) 229-5570 -- for instructions on getting their free repairs. Owners of Craftsman mowers, which were not part of the air district's promotion, can take them to any Sears store or product repair center.

Some of the people who bought the mowers at April's events said Thursday that they were still pleased with their purchases in spite of the recall.

"I've been using it, and nothing's happened so far," said Debbie Finnerty of Merced, who said she bought the mower because she needed a new one and wanted to buy one that would be better for the air.

"I like it actually," she said. "It's easy to operate. There's no gas or oil or anything to add. You just plug it in [to recharge the battery]."

Finnerty said she has received a letter about the recall but hasn't yet made arrangements for repairs. Neither has another buyer, Al Browder of Modesto, who had swapped a self-propelled Trimmer mower for the new cordless electric.

"It sounds like a simple repair, but my question is whether there's a repair station in Modesto," Browder said.

There isn't, Bello said, but she added that the district hopes to make easier repair arrangements for people there.

There are repair stations in Fresno, Sacramento and Visalia, she said.

In any case, Browder said, he's still using the mower.

"They said not to use it until you have it repaired," he said, "but I don't have anything else."

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'Spare the Air' alert goes out

Hanford Sentinel, Sept. 22, 2002

FRESNO -- Because of high levels of smog, the San Joaquin Valley Air Pollution Control District has declared today a "Spare the Air Day."

The district asks Valley residents to help cut down on air pollution over the next 24 hours by:

Carpooling when possible.

Holding off on the use of gas-powered yard equipment.

Avoiding the use of products containing high levels of volatile organic compounds such as household sprays, charcoal lighter fluid and oil-based paints.

Not using motor boats, personal watercraft or off-road vehicles.

Lawn mower recall affects valley

Mower Recall

By MELANIE TURNER, BEE STAFF WRITER September 20, 2002

Black & Decker Inc. is recalling about 140,000 cordless electric lawn mowers that pose a possible fire hazard.

Black & Decker recommends customers stop using the mowers immediately, and the company will have them repaired.

The mowers have been sold nationwide since 1996 under the Black & Decker and Craftsman brand names. Just less than 2,400 were sold at half-price in exchange for gasoline-powered mowers during San Joaquin Valley Air Pollution Control District events.

Nearly 500 mowers were distributed in April at air district Clean Green Yard Machine events in Merced, Stockton and Visalia, and 300 were distributed in Modesto last year.

The district mailed letters about the recall to people who got mowers this year. The district does not have contact information for people who participated in the Modesto event, though, because the mowers were distributed on a first-come basis.

Despite news of the recall, Herb Wilkerson of Modesto, who got his mower in Stockton for \$179 last spring, thinks he got a great deal.

"I'm real pleased with it," he said. "I'm amazed that the charge on it lasts as long as it does."

His 12-year-old grandson, Bret Wilkerson, uses the mower frequently, too.

"He loves it," Herb Wilkerson said. "He says, 'It's so much easier, Grandpa.'"

It has an instant start, and there's no messing with gas. Wilkerson said he's had no trouble with the mower, and he uses it about once a week.

"I'd recommend it to anybody," he added. "It's just so much more convenient."

It might be convenient, but an electrical component of the mower can overheat. Black & Decker has received 11 reports of components overheating, according to the U.S. Consumer Product Safety Commission. One resulted in a minor hand burn. There were nine reports of minor property damage beyond the mower.

Trained technicians must assess each mower to determine if any components are faulty.

Valley air district spokesman Charlie Goldberg said the district would need to learn more before assessing how the recall might affect the program.

The only factory-owned service centers in the valley are in Fresno and Sacramento, said Skip Duke, service manager with DeWalt Service Center in Fresno. It will take 35 to 45 minutes to repair each mower, but there are thousands of mowers to repair, he said.

Duke encourages people to make an appointment, or better yet, call Black & Decker's toll-free number -- (866) 229-5570 -- to receive a box and prepaid label to have the mower shipped to a service center.

Darrell Holmes, territory manager for Black & Decker, sells the mowers to Home Depot. He said the mowers are under a two-year warranty, and according to store policy, people can return them three months after purchase for a store credit.

Home centers, hardware and discount stores sold the Black & Decker lawn mowers from February 1996 through August 2002 for \$360 to \$400.

Craftsman mowers were sold at Sears stores from January 1998 through December 2000 for \$360 to \$400.

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AT A GLANCE

The recalled Black & Decker- brand mowers have the model number CMM1000 or CMM1000R and date codes from 9534 through 200230, both of which are on the silver and black label affixed to the rear door of the mower. They have either an orange or green deck cover with a black motor cover, and the words "Black & Decker" and "Cordless" on top of the motor cover.

Owners of the mowers can visit www.blackanddecker.com to receive information on the free repair.

The Craftsman-brand mowers, sold at Sears, have model number 900.370520 and include all date codes. The model number is on a silver and black label affixed to the rear door of the mower. They have a dark green deck with a black motor cover, and the words "Craftsman" and "24-Volt Cordless" on the cover.

Craftsman mower owners should take their mower to the nearest Sears store or Sears repair center for a free repair.

The San Joaquin Valley Air Pollution Control District has distributed just less than 2,400 Black & Decker mowers at six clean-air events in the valley since April 2001. In the northern region, events were in Modesto in April 2001, and this year on April 13 in Stockton and April 20 in Merced. Three other events were in Fresno, Visalia and Bakersfield.

Community Briefing, Modesto Bee, September 20, 2002

ENVIRONMENT

EPA rules against local pollution control district

The U.S. Environmental Protection Agency has ruled that the San Joaquin Valley Air Pollution Control District failed to submit a plan to improve the valley's air by a May 31 deadline. The finding puts in place new deadlines that, if missed, will require tighter pollution sanctions, a potential highway funding freeze and a possible federally imposed air plan. Valley air officials have been saying for many months that they could not meet the deadline. Instead, they are preparing to ask the EPA to downgrade the valley's air quality status from severe to extreme, buying the valley an extra five years to meet clean-air standards and pushing off potential federal sanctions until 2010. The May deadline was set after the EPA downgraded the valley's air quality status from serious to severe in December 2001.

Governor gets on board for bullet-train project

Davis signs measure for \$9.95b bond to build high-speed rail.

By Lesli A. Maxwell, Bee Capitol Bureau, September 20, 2002

SACRAMENTO -- Gov. Davis signed legislation Thursday that will ask voters to decide whether the state should invest billions of dollars to build a 700-mile bullet train system that would become California's most ambitious and expensive public works project.

The bill, written by Sen. Jim Costa, D-Fresno, places a bond measure on the November 2004 ballot that would authorize the state to sell \$9.95 billion in general obligation bonds to build the first 400 miles of high-speed rail tracks between the Bay Area and Southern California.

The proposed rail system -- with trains traveling up to 220 mph -- would eventually connect most of the state's major cities.

"The project we launch today ... is the largest public works project in California and possibly America, and the benefits will extend to every region of this state," Davis said during a bill-signing ceremony at the California State Railroad Museum in Sacramento.

"High-speed rail will keep Californians moving faster, cheaper and cleaner than ever before," he said.

Davis' enthusiasm for the rail bond is a turnaround from his sentiments in 1999, when he called a statewide bullet train system a "Buck Rogers" idea. When asked about his change of heart Thursday, Davis said, "I don't recall those remarks," and pledged to be active in the rail bond campaign.

Davis said if voters approve the bond, trains could be running by 2014 and ferrying passengers between San Francisco and Los Angeles in 2 1/2 hours.

The legislation's success is a sweet parting victory for Costa, who must leave office at the end of the year because of term limits. The Fresno Democrat has been the Legislature's most devoted patron of high-speed rail, writing the 1996 bill that created and funded the state agency that is overseeing the development of the \$25 billion project.

"For the 50 million Californians who are going to live in this state by the year 2030 ... it will provide them mobility to use with our other systems of transportation as well as to continue to stimulate our economic engine," Costa said.

The rail system, Costa said, is crucial to helping alleviate the Valley's chronic air pollution. The outgoing senator said he will help organize the campaign for the bond's passage.

Proposed last spring by Costa and state Treasurer Phil Angelides, the rail bond originally called for \$6 billion to cover most of the costs of building the first 400 miles of tracks connecting San Jose, Fresno, Bakersfield and Los Angeles. Costa increased the amount to \$9 billion later to include a connection to San Francisco in the first phase.

State officials estimate the first phase will cost \$13 billion. They hope federal dollars and private investment will pay for the amount not covered by the bond. Ticket sales from the Bay Area-to-Los Angeles route would pay for the second phase of construction, which would extend the system to Sacramento, Modesto, the Inland Empire, Orange County and San Diego.

The remaining \$950 million in the bond will be spent on improvements for Amtrak and commuter rail lines -- money thrown in to entice votes from lawmakers whose home districts won't benefit from the first phase of construction.

Critics of the bond call the project a boondoggle and warn that the state's fiscal health is too weak to sustain billions in new debt. Angelides, however, has said the state is carrying a modest debt load and can afford to borrow the money.

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Supervisor candidates make pledge to fix problems if elected

By BOB SABERHAGEN, Californian correspondent
Saturday September 21, 2002

Editor's note: This story was revised Sept. 21, 2002, to correct misidentification of candidate Sam Ackerman.

FRAZIER PARK -- Campaign promises flew high Thursday at a forum in Frazier Park hosted by Frazier Park's Mountain Communities Town Council as the race for Ken Peterson's vacated 4th District supervisory seat warmed up.

Candidates Sam Ackerman, Tom Fallgatter and Ray Watson appeared before an audience of 40 people assembled in Frazier Mountain Park Community Center promising to help fix the problems of the Frazier Mountain-area communities if elected to the post left vacant by the death of Peterson.

Fallgatter, a real estate attorney and investor, scored high with some residents by virtually guaranteeing paved roads for the community of mostly rutted dirt trails, some of which are barely passable by emergency service vehicles, especially during inclement weather.

Fallgatter said he has a plan that would fund new road construction using community block grants and establishing small service districts.

"It may take 15 years to pave them all, but if the community is willing, I promise I will get at least one road paved," Fallgatter said. "I propose that we attack it one street at a time. You can establish mini-districts maybe as small as a block long."

Watson, a former television executive, was more conservative on the roads issue, one of several raised by residents, saying residents would have to pay for new road construction, likely in the form of special district assessments.

"We have county roads down in the valley that have not been maintained in so many years they have turned to dirt," Watson said. "The reason is, the county is broke. If you (residents) own the roads, the county cannot legally put one piece of pavement on those roads. I don't want to be a naysayer, but the homeowners are going to have to decide to pay for them over a period of years. You have to be realistic. Do they come before the library or park or whatever else you want to do? You have to invest in yourself."

Ackerman, describing himself as a simple Buttonwillow farm boy, took the middle ground, saying that all the issues and problems of the mountain communities would require study, but in Buttonwillow, folks don't count on the county for much of anything.

"We all get together, have a good time and work our problems out for ourselves," Ackerman said. "You guys have to pull together as a community. You have to decide what your problems are and what to do about it."

While all the candidates agreed the county lacks the funds for new road construction, Fallgatter said he was confident federal and state grants could be tapped.

On the issues of animal control and code enforcement, all candidates agreed that better service could be provided throughout the county as well as the outlying areas.

All lamented the deplorable air quality throughout the county, vowing to work toward more stringent air pollution control without holding business and industry entirely responsible.

Fallgatter said it will take significant increases of restriction on emissions, noting that citizens are going to have to step up and take action and not just leave it to industry to find a solution.

Ackerman laid the county's air pollution problem on Northern California cities.

"Our air quality down here stinks," said Ackerman. "It all balls up down here. If people up north cleaned up their air, it would be better here," he said.

Watson said in addition to polluted air blowing down from the north, interstate highway traffic contributes largely to the San Joaquin Valley's bad air.

"Pretty soon you won't be able to see the stars," Watson said. "We have thousands of trucks and cars going up and down the interstate. A lot of it comes from people who drive by here and from up north."

Residents voiced concerns about encroaching housing and commercial development.

"Bakersfield is encroaching on the country," Ackerman said. "Before long the city grows closer and closer and soon the farms turn to housing developments. Agriculture is important to Kern County."

Watson urged residents to protect their rural atmosphere.

"Once it's gone, you can't get it back," he said. "I don't believe in incompatible land uses in proximity to one another. There's nothing stopping a community from deciding what it wants, where it wants to go. Every community has to look at their own individual assets and what it wants to be."

Fallgatter told residents they must communicate to supervisors their vision of the community's future.

"The issue to me is, what does the community want?" Fallgatter said. "Some planning issues are easy. You don't put a dump next to a residential area. Other issues are not so simple. I would meet with a broad base of citizens to find what the community thinks. It would be foolish for me to say today that I know what they think. I will look to them for answers."

Frazier Mountain-area residents will answer at the polls with their choice of supervisor in November, but not before seeing them together again in Pine Mountain on Oct. 11 at 7:30 p.m. in the Pine Mountain clubhouse.

Opinion Poll, Bakersfield Californian

Gov. Gray Davis signed a bill Thursday asking voters to spend \$9.95 billion on a high-speed rail system. Would you support the bill?

Saturday September 21, 2002, 08:40:08 PM

No. Surely we can find a better use for nearly \$10 billion than on this "Buck Rogers transportation system." (39.13%)

Yes. Current trains are too slow, and freeways are getting congested. We need a faster means of statewide travel. (38.59%)

Yes. This sounds like the perfect start toward cleaning up the valley's air quality problems. (22.28%)

Waste gas now used as energy

By ERIN WALDNER, Californian staff writer
e-mail: ewaldner@bakersfield.com

Saturday September 21, 2002, 04:05:05 PM

A new form of technology that generates energy cleanly is also generating interest in Kern County.

Microturbines are small turbine engines that drive a generator, producing between 25 to 500 kilowatts of electricity either continuously or as needed. They're about the size of a refrigerator, so they can fit in small spaces. They run on gaseous and liquid fuels, including natural gas.

"Microturbines have only been on the market about three years," said Ed Henderson, national sales director for Ingersoll-Rand Energy Systems, which assembles microturbines in North Carolina. "A microturbine is a new product. It hasn't been around very long."

Henderson recently gave a presentation in Valencia on IR's PowerWorks microturbine.

Representatives of several oil and gas companies with operations in Kern County attended.

"A microturbine provides an on-site opportunity to consume casing gases at the wellhead while emitting very low NOx (nitrous oxide emissions)," Henderson said later. "In the case of the IR PowerWorks unit, we emit about 5 ppm (parts per million) NOx when burning natural gas."

In almost all operations, natural gas and water are produced with the oil.

It's possible to capture this "associated gas" and reinject it to maintain wellhead pressure. But this can be expensive because the gas needs to be compressed.

An alternative is to flare the gas. But this produces emissions and requires permits.

Then there's stranded gas, which is natural gas that can't be economically transported to consumers. The gas may be too far from a pipeline, for instance, or it may not meet pipeline requirements.

"These small quantities of gases -- stranded gas assets -- are usually a problem because of the various regulations affecting them with which the producers must deal with," said Casper Zublin with the California Oil Producers Electric Cooperative (COPE). "So why not turn a liability into an asset? By doing so, the cost of electricity to the producer would be lowered and the gas used in a triply beneficial way -- improved environmental aspects, electrical power generated and heat provided where needed."

Microturbines are a form of cogeneration.

Cogeneration plants, such as Sycamore at the Kern River field, generate electricity and produce steam that's used to pull heavy oil out of the ground.

Zublin said the market for microturbines is not in direct competition with larger cogeneration facilities.

"Being small, they (microturbines) are easily located at points in the field where they can be best used," he said.

He also said large cogeneration plants sell their excess power to the state grid while small microturbines do not. They focus on reducing power normally purchased from the state by using a stranded asset, natural gas.

Microturbines evolved from automotive turbochargers, auxiliary power units for airplanes and small jet engines.

Microturbines are well suited for small commercial buildings such as restaurants, hotels, motels, small offices and retail stores, according to the state's Distributed Energy Resources Guide on microturbines.

According to the company, PowerWorks turbines are installed at an ice rink in Southern California, a community center in New York, an oil refinery in Pennsylvania and a commercial greenhouse in Colorado.

Patti Kusek, from Crimson Resource Management's Bakersfield office, said following the Valencia presentation that her company has been in the market for a microturbine for two years.

"Being an independent, you end up with a lot of stranded gas," she said. "You're throwing away energy."

She said Crimson is considering installing microturbines to power its submersible pumps. A submersible is a pump located in a hole, below the level of fluid in a well. It's usually driven by an electric motor.

"It takes a lot of energy," Kusek said.

John Limousin, a project manager at Aera Energy LLC, also attended the meeting. It's his job to keep an eye out for new projects.

Limousin said Aera is interested in microturbines and other technology that would help it become more independent of the state. High energy costs in California drives down oil companies' profit margins.

Clifton Simonson, president of Bentley-Simonson Inc. in Ventura, said his company has purchased three microturbines to be installed at two Los Angeles fields the company owns.

"Essentially, our strategy is for a win-win situation whereby we offset our electrical costs using natural gas ... that would otherwise be a wasted byproduct of our oil production," Simonson said.

"This is gas that is commonly flared in Bakersfield and other areas that allow this practice, but due to SCAQMD (South Coast Air Quality Management District) regulations and the desire to more efficiently run our operations, we have taken a liability and converted it into an asset."

He said he decided against selling the electricity back to the state because of low economic incentives.

Microturbine capital costs range from \$700 to \$1,100 per kilowatt, according to the Distributed Energy Resources Guide, which says microturbine manufacturers hope to bring the cost down below \$650 per kilowatt.

The U.S. Department of Energy is working with utilities, energy service companies, industrial manufacturers and equipment suppliers to further along microturbine technology. The Microturbine Program aims to develop advanced microturbine systems for commercial use.

This is a six-year program (2000-06) with \$60 million in federal funding.

Five manufacturers are involved in the program, including GE, Ingersoll-Rand, Solar Turbines, United Technologies and Capstone, based in Chatsworth.

Fifty 30-kilowatt Capstone microturbines were installed at a Los Angeles landfill in August 2001 to convert methane gas collected at the site into electricity.

HART'S EUROPEAN FUELS NEWS/PBI Sep 18, 2002

Futurists talk dreamily of a "hydrogen future" where the internal combustion engine

and fossil fuels are replaced by "clean" hydrogen and fuel cells.

But practical reality tells a far different story today: Diesel/distillate fuels (including jet fuel) do all the heavy lifting on this planet - for good reason.

That's because distillates are cheap, abundant, available everywhere, and have by far the best energy density of any fuel.

Still, hydrogen proponents see a day coming when diesel and gasoline feedstocks (mostly from crude oil) dry up, and then something else has to replace them.

But according to most oil & gas experts, the replacement won't be natural gas, since this is just another fossil fuel being depleted at virtually the same rate as crude oil.

Coal could replace some liquid hydrocarbons, as Sasol does today with its gasified-coal gas- to-liquids (GTL) plants, although at a cost higher than crude-based fuels.

But "global warming" concerns could sharply limit such cheap fuel feedstocks, since it's so difficult and expensive to "sequester" CO₂ emissions from coal or oil/tar-sands gasification with today's technology.

Only two "non-carbon" fuels - hydrogen and electricity - potentially could replace fossil fuels, as U.S. Department of Energy office of heavy vehicle technologies director James Eberhardt told the Diesel Engine Emissions Reduction (DEER) workshop in San Diego, Calif.

However, both hydrogen and electricity today are produced (mostly) by fossil fuels with only limited potential for hydropower, solar or wind to produce hydrogen or electricity to meet enormous energy demands at competitive prices.

Nuclear could do it, but "greens" hate nukes, and people are terrified at the consequences of nuclear waste transport and storage.

Even if some other hydrogen or electric energy "non-carbon" feedstock source could be found, it's not clear that "clean" power could be produced at anything close to what most consumers would pay, especially in "third world" emerging economies.

Even if a hydrogen production breakthrough occurs, more breakthroughs would be required for practical, low-cost distribution and on-board energy storage, Eberhardt showed.

"That's 316 cubic feet of cargo space lost, with a potentially dangerous [hydrogen] pressure vessel," Eberhardt pointed out.

Even liquid hydrogen only has one-fourth the energy density of diesel fuel, and it would require very costly production and storage, as well as raise new safety issues.

If the same truck were to run on electricity, then 85% of the entire weight capacity of the truck would be taken up by batteries just to go 500 miles

(half the range of diesel), Eberhardt showed.

As an alternative to batteries or on-board pure hydrogen storage, one automaker has proposed sodium borohydride as a "compact and portable" way to carry hydrogen.

However, this is hugely inefficient from an energy standpoint, since it takes more energy to make sodium borohydride than the energy released or recovered in the fuel cell, Eberhardt showed. The required high-temperature (900oC) sodium borate to sodium borohydride reaction will result in large amounts of CO2 emission.

What's more, it would take 26 84-gallon tanks of sodium borohydride (13 tanks for the solution, 13 tanks for spent fuel) weighing over 15,000 pounds just to equal the energy from two 84-gallon diesel tanks on a heavy truck. This would be a huge, unacceptable weight and space penalty for trucking.

Plenty of other obstacles stand in the way of replacing diesel with hydrogen, including the big energy losses accompanying the electrolytic splitting of water to hydrogen, the need for efficient and low-cost on-board hydrogen storage (or an highly efficient on-board hydrocarbon fuel reformer), and the need for greatly reduced precious-metal catalyst loadings in the fuel cell stack/reformer system.

Meantime, diesels just keep getting cleaner and better, thanks to much-improved fuel quality (ultra-low sulphur diesel), greatly improved engine/combustion technology (direct-injection rate shaping, electronic controls) and emerging versions of homogenous-charge compression-ignition (HCCI at part load).

Exhaust catalyst technologies that will nearly eliminate nitrogen oxides (NOx) and particulate matter (PM), and electric-hybrid technologies, also are pushing diesels to the forefront of the world's vehicle technologies, at far lower costs than alternative fuels/systems.

This means that clean, ultra-low sulphur diesel (and gasoline) will continue to dominate transportation fuels for many years to come.

"With no alternative yet identified, it appears that hydrocarbon-based fuels from a variety of feedstocks will be the future fuels for heavy-duty vehicles," at least for the next 15-25 years, Eberhardt said.

Still, pursuing a hydrocarbon path won't get the planet anywhere near the target United Nations greenhouse gas "stabilization" level, as James Dooley, staff scientist at Battelle/University of Maryland's Joint Global Change Research Institute, showed here.

The only technologies that could make a big difference in "stabilization" would be carbon capture, geologic sequestration, hydrogen systems, better energy storage systems and commercial-scale biomass energy, he said. None of these are simple or cheap.

Change won't happen because the earth is "running out of fossil fuels," but rather, because of climate change issues, Dooley said.

Problem: "We cannot do this 'at any cost,'" Dooley recognized. Slashing

greenhouse gas (GHG) emission via technological innovation is likely to happen in the industrial and buildings sectors first, followed by transportation, he said. Each sector accounts for about one-third of human GHG emissions.

Carbon taxes likely will be much more effective in industry/buildings sector GHG reduction, but transport "decarbonization" looks a lot more complicated, he said. One critical issue is where to produce the "decarbonized" fuel - at a refinery, on-board a vehicle, or someplace else?

Meantime, while converting heavy-duty trucking to hydrogen looks exceptionally difficult, it might be possible to introduce hydrogen power into some limited-range, local delivery trucks, if not the long-distance Class 7/8 heavy trucks, according to Jay Keller of Sandia National Laboratories.

If cost-effective production and storage of hydrogen can be developed, then it may be possible to use hydrogen in truck fleets operating out of a centralized fueling site, for trucks that never go more than 100 miles/day, he showed.

To achieve the 100 miles minimum range, either liquid or hydride storage probably would be required, given the average miles/day of typical Class 1 through Class 6 trucks, he showed.

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By Jack Peckham

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