



Alive!



Budget Cuts: Is Your Job Affected?

Mayor's budget asks all to 'share sacrifice' to overcome \$530 million deficit.

CITYWIDE — On April 20, Mayor Antonio Villaraigosa proposed a budget that cuts 10 percent from personnel costs. The proposed budget cuts are in response to a projected \$530 million deficit in the City's current fiscal situation, caused largely by a decrease in revenues in a tough economic climate.

The budget proposal now goes to the City Council, which has until June 12 to amend and approve a budget for fiscal year 2009-10.

Will the budget cuts affect your job?

The mayor's proposed budget relies heavily on a reduction in the salaries of unioned City employees, plus the leasing of City-owned parking garages.

The City has launched a Website, www.keeplaworking.com, to give the details of the proposed budget cuts.

Read more details in the story on page 42.

Tough Times Call for Club Scholarships

Applications available for Club Scholarship 2009.

THE CLUB — The tough economy is squeezing the household budgets of Club Members. But those with college bills to pay should apply for a Club Scholarship. Applications are now available. Ten people will receive stipends for their academic achievement.

"Because so many people were asking about the Club Scholarship for 2009, we decided to start a month early and make the application forms available in April," said Club CEO John Hawkins. "Make sure you apply as soon as you can. We want to do all we can to encourage achievement by the Club family."

The scholarship is open to Club Members, spouses and their immediate families under the age of 25, for those who attend an accredited college, or will attend one next year.

Ten awards totaling \$10,000 will be awarded, each for \$1,000. Deadline is noon June 30, 2009; applications must be physically in the Club Store and Service Center, 120 W. Second St. downtown, at that time.

Applications are available at the Club Store, or they can be downloaded at:

www.cityemployeesclub.com/scholar.asp

See the story and official rules on page 45.

Alive! Exclusive

The Winds of Change

The DWP is serious about the future of green power with the soon-to-open Pine Tree Wind Project, the country's largest city-owned wind farm. Come along as Alive! tours this awesome new facility north of Mojave.

See page 6



Richard Whites (left) and Louis Ting of the DWP stand in front of one of the turbines at the Pine Tree Wind Farm.

Alive! photo by Tom Hawkins



City Employees Club of Los Angeles
350 S. Figueroa St., Suite 700
Los Angeles, CA 90071

CHANGE SERVICE REQUESTED

PRSR STD
US POSTAGE
PAID
LOS ANGELES, CA
PERMIT NO. 447

Dodgers Tickets!

See page 64.



THE *ALIVE!* INTERVIEW



From left: Club CEO John Hawkins with the DWP's Richard Whites and Louis Ting on a clearing at the Pine Tree Wind Farm. Some of the 80 DWP turbines are in the background.

Alive! Exclusive

Catching the Wind

With the **Pine Tree Wind Project** north of Mojave, the DWP shows it's serious about the future of green power. Come along as **Alive!** tours this awesome project – the country's largest city-owned wind farm – and be proud of your City.

DWP

THE ALIVE! INTERVIEW

The Winds of Change

The Pine Tree Wind Project's construction managers, engineers and executives share their stories on building this very important City project.

PART 1:

Building the Project

On April 7, Club CEO John Hawkins and *Alive!* editor John Burnes toured the City's Pine Tree Wind Project, which was already producing electricity for the City while still in its testing phase. After the tour, *Alive!* sat down with Louis Ting, Site Manager for the Project Management Team, and Richard Whites, Pine Tree Maintenance Supervisor, to hear about the construction of the facility. —Ed.

Alive!: Thanks so much for that great tour. Now, Louis, you're the Site Manager. And that means...

Louis Ting: I oversee all the construction by the Contractor.

Okay, got it. And you, Rich?

Rich Whites: I am the Pine Tree Maintenance Supervisor. I'm responsible for the care and feeding of the project once it's established.

Louis, when did you start on the project?

Louis: I came into the project when the department decided to become the developer. We used to have a developer. But by the time I joined the project back in 2007, we decided to become our own developer, meaning we hired our own contractors.

What project had you worked on before this one?

Louis: I was on the Power Plant II redevelopment project at San Francisquito. Before that, I was at the Haynes Generating Station project, and before that I was part of the water system, doing the water pipeline rehabilitation for the City.

And here we are in April and you've been testing the Pine Tree Wind Project, and you're just about ready to cut the ribbon. That is an incredibly short amount of time to build all of this.

Louis: It's a team effort, there's no doubt about it. It took a lot of effort from the whole department, from public affairs all the way to legal and purchasing. And environmental: We have a very large environmental group in our department that supported us to make sure we could start construction. We couldn't have our backhoes and our dozers out here until the environmental issues were cleared.

When you were given this task, was it something you had ever thought of doing before? Was this a dream of yours, or was this sort of out of the blue?

Louis: Well, I was volunteered. [*He laughs.*—Ed.] To be very frank with you, when we were at the Haynes Generating Station Project down in Long Beach, there were five of us there, and we were all



Above: Louis Ting, Site Manager for the Project Management Team. Right: Richard Whites, Maintenance Supervisor.

About 335 feet or 33 stories tall!

Alive! Exclusive!

#130001

Pine Tree Wind Project, located north of the Mojave, is the largest city-owned wind farm. It features 80 GE Wind Turbines (1.5 megawatts each).

engineers. We were just kind of looking at each other, saying, "So you're going to be on Pine Tree." "No, you're going to be on Pine Tree." "No, you're going to be on Pine Tree." We were all guessing because we all knew this is two-and-a-half or three hours away from our homes. Nobody wanted to go. It was away from family. I was also volunteered to go to San Francisquito, which is also very far from my house. But I was there for only six or seven months. And then I got a call from my boss saying, "You're going to Pine Tree." I spent about a year downtown getting this project ready, writing the contracts, getting the contracts approved.

Now, looking back, how do you feel about it?

Louis: I would never have done anything else. This is just unbelievable. Like Rich said, this is once-in-a-lifetime chance to construct a project from the ground up, and it's a part of the renewable energy portfolio that we have. It's monumental.

Did you have any idea of the magnitude? It's one thing to put it on paper, but then when you get up here, you realize, Holy mackerel, this is huge.

Louis: It is huge, and Haynes was huge. As far as the logistics, this was a much bigger magnitude than I could imagine.

Do you know of any other cities in the country that could pull something like this off?

Louis: I don't know, but I don't think so. I don't think any other municipality could purchase the land, buy the equipment, get a contractor and build a farm like this. We've been told by General Electric [a wind turbine supplier on the Pine Tree Wind project] that they have never seen a site like this. A typical wind farm is like a farm. It's rolling hills at most. This is mountainous terrain, very difficult to work on, just trying to get equipment up here. You can imagine these 123-foot blades getting up to the roads without any type of damage. We didn't have any real damage from transportation. It was a task.

That is amazing.

Louis: That is significant. All the credit goes to the design team and construction. We had a design team that really did a good job of mapping this out.

The design team at the DWP?

Louis: Partially, yes. We had the conceptual design, and then we hired a contractor to do some engineering and procure some of the equipment. We bought the turbines and they bought the transformers and so forth and they constructed them. Their responsibility is to take the equipment that we purchased, the turbines, and transport them from the storage yard all the way up to each site.

The Transportation Challenges

How did you get the turbines from Germany to the Mojave yard and then up the mountainside?

Louis: Well, we purchased the equipment from GE, and we sent one of our senior engineers to Germany to inspect these nacelles [the turbine generator boxes at the top of the towers]. He was there for about three weeks inspecting various processes of the manufacturing. And for the towers, because we had certifications from GE, we did not go to Korea or China and inspect them. But there are internal GE inspections, and we received the reports. For the blades, our people went down to the loading docks before they were unloaded from the ships.

In Brazil, where they were made?

Louis: In the United States, at the Port of San Diego, where they were unloaded. That's how we started the process. And then, we stored these turbines at the Mojave Airport. They were in storage for about a year-and-a-half, and while we got our contract ready with Kiewit [the main subcontractor that built much of the Pine Tree Wind Project. —Ed.] For the electrical transmission line, we had another contract with Par Electric.

So the turbines arrived by ship?

Louis: That's right. The turbines came all by ship, and they were unloaded in San Diego. And they were transported via tractor-trailer combinations with special types of trailers for the turbines, the blades and the tower sections.

Each generator nacelle weighs almost 60 tons. They require special heavy-haul tractor-trailers. And they could drive only at certain times of the day and on certain roads.

We brought them up on US-58, all the way from San Diego.

They couldn't go on the US-14.

Louis: They couldn't go on the 14. That was not permitted.

Sixty tons each.

Louis: Almost, the whole nacelle case with the shipping fixture and everything else.

Rich: The box up on top of each tower is large enough that you can put a large-size pickup truck inside of it and have room.



That little box.

Louis: That little box at the top is big enough to hold a pickup truck.

Rich: Easily.

The blades aren't as heavy; they're made out of fiberglass?

Louis: Yes, and they came in pairs. There were two blades in one fixture.

How long are the blades?

Louis: 123 feet each.

How long is the normal trailer?

Rich: Seventy-one feet, I think, is the legal limit.

So, same thing, you came up the 58, with special permits.

Louis: That's correct.

And how many blades in total?

Rich: 240.

Louis: So, 240 blades, and 240 tower sections. Each tower has three sections — the base, the mid and the top.

And the towers came from China and Korea?

Louis: Right. About half and half.

The base section is about 23 feet tall, and the middle and the top are about a 85 and 96 feet tall each, I believe.

Upon This Rock

How deep into the ground is the foundation?

Louis: The concrete pad itself is about five feet deep. It's about 24 feet in diameter. Because of the terrain, we didn't have the luxury of [flat] real estate. So, what the designer did, instead of using a large diameter concrete pad, they used rock anchors. Each

— See PART 1, page 14

Green-Collar Jobs:

Learning to Be Green

The DWP is retraining many of its employees to better understand sustainable power.

The DWP has put nine employees through the 15-day GE Wind Customer basic class, and three employees have completed the four-day GE Frequency Converter class. All the craft employees, Supervisors and Managers go through the four-day Tech Safety Line Competent Climber and Rescue training. The department also depends on its Professional Services Contractor, Airstreams, to provide on-site hands-on training and oversight, classroom training and administrative support for the Pine Tree team.

The final staffing level at Pine Tree is still being determined as the department gains experience and develops the knowledge/skills to operate it. Optimal staffing is thought to be 19 full-time employees.

The DWP will also need the support of various other crafts and organizations on an intermittent basis. These will include Storekeepers, Warehouseman, Equipment Operators, Heavy Equipment Operators, Truck Drivers, Building Repairman, Electrical Distribution Mechanics, Communication Employees and Gardeners.

DWP

THE ALIVE! INTERVIEW

DWP: Toward Green Power

The Pine Tree Wind Project, while the DWP's flagship, is just one of the department's ongoing green projects; the DWP is fast becoming a greener utility.

The department is on track to significantly increase its green power portfolio to 20 percent by 2010 of all power supplied to customers and 35 percent by 2020. This aggressive renewable portfolio standard (RPS) is aimed at reducing greenhouse gas emissions and creating clean, sustainable energy generation from renewable resources such as wind, solar, geothermal, small hydroelectric, biomass and waste-to-energy.

Pine Tree and other renewable projects will also help the City meet its greenhouse gas emissions reduction requirements under AB 32, the Global Warming Solutions Act of 2006, and Mayor Antonio Villaraigosa's climate action goal to reduce greenhouse gas emissions to 35 percent below 1990 levels by 2030.

The RPS policy provides a long-term framework to achieve the goals without compromising power reliability or the financial stability of the department and its customers.

The DWP's renewable energy supply has increased from three percent in 2005 to more than 11 percent in 2008. By the end of 2009, with the advent of Pine Tree and other projects, the DWP expects to achieve 14 percent renewables.

Pine Tree will join other renewable resources either developed and owned by DWP or acquired through long-term power purchase agreements, some of which include future ownership opportunities. Following is a snapshot of the DWP's renewable energy projects:

Upcoming:

- Pine Tree Wind Farm, Cantil, CA, 120 megawatt capacity, owned by the City; online in June
- UPC Milford Wind Project, Utah, 185 megawatts, purchase agreement; online this fall

Existing:

- L.A. Aqueduct Small Hydro, Owens Valley and Santa Clarita, 166 megawatts, owned by the City;
- Hyperion Biomass Digester Gas, Los Angeles, 16 megawatts, owned by the City;
- Solar Rooftop, Los Angeles, 14 megawatts. City- and customer-owned;
- Bradley and Penrose Biomass Landfill Gas, Los Angeles, 12 megawatts, purchase agreement;
- Iberdrola Pleasant Valley wind project, Wyoming, 82 megawatts, purchase agreement;
- Iberdrola Pebble Springs wind project, Oregon, 69 megawatts, purchase agreement;
- Willow Creek wind project, Oregon, 72 megawatts, purchase agreement;
- Sepulveda Small Hydro, Los Angeles, 8 megawatts, purchase agreement; and
- Powerex Small Hydro, British Columbia, 50 megawatts, purchase agreement.

In March, the DWP issued a continuous "rolling" RFP seeking renewable energy proposals for approximately 1,000 gigawatt-hours per year. These proposals will be accepted anytime throughout the year and opened each month.



Building Pine Tree

The DWP hired Kiewit as general contractor; the company performed most of the construction tasks. After the site was prepared and the roads built, the tower construction began. Lower right: Rigs were used to anchor the tower bases into the bedrock, and then the towers were constructed. Each tower came in three separate pieces and was assembled on site. Top, above left and left: The fiberglass blades were attached to a hub near the ground, and then the whole assembly was lifted into place and bolted onto the turbine nacelle, more than 25 stories above ground level. Above right: The blades arrive in San Diego from Brazil aboard a cargo ship.

The Winds of Change

PART 2:

Designing the Project

On April 13, Club CEO John Hawkins and Alive! editor John Burnes interviewed the team that designed the Pine Tree Wind Project: Bob Gentner, Project Manager; Nazih Batarseh, Manager, Project Section; and John Dennis, Assistant Division Head, Engineering Services. —Ed.

Alive! So, Bob, what are your responsibilities relating to Pine Tree?

Bob Gentner: I'm the Project Manager. I manage the project, from the beginning of its conception. In this case it started at the end of 2004, and through to the point of completion, where it goes into service to provide generation to the department. It's a combination of design, procurement, construction and environmental concerns.

And you, Nazih?

Nazih Batarseh: I basically direct all the power generation projects. And Pine Tree is one of those projects. We have other projects like the Haynes Generating Station repowering, the Scattergood Generating Station repowering and the Castaic Modernization Project. Pine Tree is one of those projects.

And you, John Dennis, you oversee these two.

John Dennis: These guys really put their hands on the project.

Nazih: To John's credit, he's really been giving us a lot of direction.

John: I'm the Assistant Division Head for Engineering Services Division. We oversee a variety of large projects and engineering for pieces of our power system.

And Pine Tree is one of those projects.

John: That's correct. Overall since about 2001, this team has installed about \$1.8 billion worth of power projects here at the DWP.

Bob, we hear you're retiring in June.

Bob: Yes.

Congratulations. How many years?

Bob: 39.

So is Pine Tree your last project?

Bob: Yes it is.

Wow, what a great project.

Bob: Yeah, it was interesting. And I'm going out with a bang.

When did you start working on this project?

John: Bob was responsible for a Notice to Proceed to the contractor that's out there developing right now. That was about 16 months ago.

Bob: 2007 was basically the start of the construction.

From barren land to today.

Bob: The contract was awarded in September by the board. And design started right away on that, and construction itself started in December 2007.

That's fairly fast, it would seem, to get 80 of these huge towers constructed.

John: Fast, with regards to the rugged terrain. That's what's unique here -- the rugged terrain.

Bob: It's probably one of the most rugged terrain wind farms in the United States. We've had people like General Electric, which has done many, many wind farms, and they're even amazed at the terrain difficulty on that particular site.

Usually you'd think of a flat parcel.

Bob: Yes, a cornfield or something like that.

Right, so how did you pick this hilly terrain?

Bob: As I understand it, this proposal was selected as being the best of the proposed sites that were offered. And that's why we moved forward. One of the aspects to this particular project

is it's fairly close to our existing transmission line. You have to be close to the transmission line. All we had to do is put in about a nine-mile transmission line connection. So that was a major factor for selecting this site.

The other part of it has to do with the land availability for the use of developing wind.

Capacity factor is one of the other things you look for. And that particular area is one of the prime areas in the state of California. Probably Palm Springs is the other area.

Had you done wind surveys of the area?

Bob: Yes, oh yes. The difficulty was the terrain itself -- could it be built? And obviously we have built it.

Were there other City departments involved?

Bob: I think it was all DWP, but we've had the water system provide support to us. They built a bridge over an aqueduct there that we needed for the transport equipment, and they provided that support and design and constructing the bridge over their aqueduct.

John: They provided us with the water, also.

Bob: Right, which is very essential because you need water for construction.

And the other part has been within the department -- there are two electrical switching stations, and what we call a substation collection station. Those were designed by in-house engineering people, and then constructed by in-house construction people.

Care to give any shout-outs to people in those divisions?

Nazih: Yes. Mark Zumwalt.

Bob: Mark Zumwalt was the superintendent for one of the switching stations. And he also started the collection station, and then Larry Markette finished it up.

And the line transmission group?

Bob: The design and procurement of the materials for the transmission lines were done in-house.

Nazih: The Barren Ridge and Pine Tree Substations and the transmission lines were designed by our engineers. Barren Ridge and the substation were designed and built by DWP folks.



Nazih Batarseh, Manager, Project Section.



John Dennis, Assistant Division Head, Engineering Services.



Bob Gentner, Project Manager.

Turbine Technology

There are all types of wind turbine generators.

Bob: Yes, there are different suppliers. At the time that this project was going, there were probably two major suppliers of wind turbines in the United States: Vestas is one of them, and GE is the other one. Now, since then, the market has increased; there are more people getting into it.

John: With the permitting in this particular area, we were looking at the 1.5-megawatt machines [each].

And these wind turbine generators, how do they compare with the ones City employees might see out in Palm Springs?

Bob: They vary. The new ones are up around 2.2 megawatts today. The 1.5-megawatts at the time that we purchased them was typical of the industry.

When they were first developed by GE, they were probably the biggest out there. But Vestas came back fairly shortly thereafter with a comparable one, and maybe an even a little higher capacity.

John: You'll start to see machines that are now in the 2.5-megawatt range. They're larger.

Are they bigger?

John: Yes.

Taller even?

Bob: Oh yes, yes, yes.

John: Yeah, they're taller. Some of them will be 85 meters or something like that.

Ours are 60 meters, right?

Bob: Right. There's another wind farm up there, run by Florida Power and Light. Those are all probably less than half a megawatt. They're about seven or eight years old. At the time that was the highest capacity available. The disadvantage to that is construction costs are very high because you have to do each one individually; you get the advantage of size when you get a bigger and bigger turbine. That's what has made the wind energy more economical than it was say 10 years ago, when it was pretty pricy.

Ours produce AC current, as opposed to DC?

Bob: It starts out with a DC, and then it's converted to AC.

It's converted right there at the tower.

Bob: Yes.

And it's shot through the transmission line as AC.

Bob: That's correct.

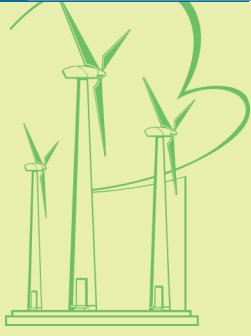
We love the feature where they turn into the wind. While we were watching them, you could see them turn into the wind. That's amazing. Is that new technology? How does that work?

Bob: We have an anemometer on each turbine,
— See PART 2, page 14



Richard Whites demonstrates just how wide the turbine towers are at their base.

Fact Sheet



DWP Pine Tree Wind Farm, a Green L.A. Initiative

The DWP Pine Tree Wind Power Project is the largest municipally owned wind farm in the United States, producing 120 megawatts of clean, renewable wind energy. This amount of energy serves some 56,000 households in Los Angeles while reducing 200,000 tons of greenhouse gases—about the same as removing 35,000 cars from the road.

- Features 80 GE Wind Turbines (1.5 megawatts each) sit on 8,000 acres of rugged terrain.
- Produces 120 megawatts peak total output.
- Includes 8.25 miles of new transmission lines built to Barren Ridge Switching Station, connecting Pine Tree wind power to high-voltage, north-south transmission into Los Angeles.
- Provides 1.4 percent of the 20 percent that is Los Angeles' renewable energy goal; brings renewable power to nearly 13 percent of L.A.'s total power supply.
- Displaces at least 200,000 tons of greenhouse gases, eight tons of nitrogen oxide, and 11 tons per year of carbon monoxide (compared to a fossil fueled power plant).
- Displaces an amount of CO₂ that's roughly the same as removing 35,000 cars from the road or planting 1.4 million trees.

Construction:

The challenging work of building the Pine Tree Wind Project involved constructing 34 miles of roads, transporting large and heavy equipment to the turbine locations, constructing turbine foundations and erecting the turbines, laying 31 miles of underground cable to feed a collector station, and accomplishing these tasks during windy, wet weather months. The location of each wind turbine was verified by a wind expert to ensure they achieve maximum wind capacity.

Milestones:

- DWP was issued Notice to Proceed on Oct. 1, 2007.
- Construction started on roads and lay-down areas Dec. 3, 2007.
- Groundbreaking ceremony was held Jan. 31, 2008.
- Project site grading took place January through October 2008.
- Transporting and erecting turbines took place April 2008 through March 2009.
- Test phase and commissioning of turbines (each turbine will be tested and commissioned after it is erected) took place October 2008 through May 2009.
- In service: Summer 2009

Fun Facts About Each Wind Energy

1.5 Megawatt GE Turbine:

- Produces enough clean electricity for about 400 homes each year.
- Stands more than 213 (Pine Tree Towers are 65 meters) feet tall (as tall as a 20-story building).
- Weighs about 200 tons [this is the entire turbine weight].
- One blade is 123 feet long (sweeps the area of a football field).
- Rotor blades have a diameter of 253 feet, and turn at 20 rpm at peak rotation.
- Powers more than 9,500 refrigerators per year.
- Produces 2,000 horsepower, more power than 12 cars.

Re seeding

The project is also re seeding approximately 310 acres of the high desert with area-native plants and foliage. This includes 280 acres for the main Pine Tree range and 30 acres for Barren Ridge and Transmission Line Projects.

The entire Pine Tree project was the combined effort of some 400 LADWP employees and contract employees from GE, Par Electric, and Kiewit.

LADWP divisions and business units included:

- ISS construction
- Fleet
- Station test
- Survey
- Engineering support
- Project management
- Environmental support
- Operation and maintenance
- Overhead Transmission Engineering

PART 3:

The Long View

On April 13, Club CEO John Hawkins and *Alive!* editor John Burnes interviewed H. David Nahai, CEO and General Manager of the DWP. —Ed

Alive!: Thanks, Mr. Nahai, for talking to us today.

David Nahai: Certainly.

What do you think Pine Tree means to the City?

David: It's of great importance to the City as a whole, because it is the largest municipally owned wind farm in the nation. It's a matter of great pride, both for the City and for the department to be able to construct, own and operate a 120-megawatt wind farm, with the second phase yet to come. This really shows the mettle and the competence of the employees at the department and shows what it is that our great City is capable of.

So, do you think that this project will help put L.A. on the map as a City that's leading the way in renewable energy throughout the country?

David: In many ways, it already has because it really is a flagship project, and it demonstrates L.A.'s commitment to renewable energy and to reduction of greenhouse gas emissions. This project alone will provide power to maybe 60,000 households. If you think of three or four people per household, that's between 180,000 and 240,000 people who will derive their power from this emission-free resource. It'll prevent 200,000 tons of CO₂ getting spewed into the atmosphere.

And it's a precursor of things to come because, as I said, there's another phase of the project, this time for 150 megawatts that's going through the process right now.

And this is just wind. We're also doing a great deal of other things to move principally away from coal, which is a polluting resource in terms of greenhouse gas emissions, towards renewable energy. And all of this is in keeping with the mayor's very bold vision of going to 20 percent renewables by 2010.

Next year.

David: Thirty-five percent by 2020. And no other utility in the entire nation has voluntarily adopted a 35-percent-by-2020 mandate. No one's done that. But this mayor has asked us to adopt that as a firm policy of the department. We have, and we're going to be marching towards that objective.

In addition, the mayor has adopted the standard of reducing our greenhouse gas emissions as a City to 35 percent below 1990 levels by the year 2030, which is very ambitious. Again, I don't know of any other municipality to have made that kind of a commitment.

So, all of this is in keeping with that vision. But it isn't solely an environmental aspiration. We also have to remember that



Alive! Exclusive!

The Winds of Change



DWP CEO and General Manager R. David Nahai explains the Department's long-range green energy plans to Club CEO John Hawkins.



there are requirements that are being imposed upon us such as under AB 32. The City supported that for the reduction of the carbon dioxide and other emissions. Or SB 1368, which again, we supported, which will prohibit the importation of power from polluting sources when current contracts run out. So, all of these things compel us to move in a different direction, which this department is doing in a very aggressive and committed way. But it's really under the leadership of the mayor and with the support and encouragement of a very progressive City Council.

But I have to add, at the end of the day, I couldn't be prouder of the women and men of the department who have embraced what is really a transformation, and they're the ones who are truly making it happen. And they're the ones who have developed this wind farm that is even currently producing energy. They're the ones who have brought it to fruition. And they're the ones who truly deserve the accolades.

So, the mayor has been completely supportive.

David: Very supportive. Very encouraging. And you need that kind of committed leadership at the top. It gives people the energy that they need to move forward with what has not been an easy project because it had difficulties in its inception when, actually, it wasn't a City project. It was under the care and responsibility of an outside contractor. And that's where I think we encountered

most of the difficulty. Once the project was adopted as a department project, in terms of its construction, in terms of its operation, then things started to really gel and come together. Each one of those turbines up there that is producing energy represents a true statement about the tenacity and dedication and competence of the women and men of the department.

Leadership Position

Has this project changed you in your views of renewable energy, or enhanced your excitement level about what's possible in the future?

David: Certainly the success of the project is very heartwarming and very encouraging. And it reveals the talent and the capability that we have to do these things. I couldn't be prouder of being associated with it. We're seeing the proof. We're seeing power flow from it already, and we'll have it fully completed by the end of June.

We were there standing at the base of many of them, and it's transformational.

David: They're as long as the fuselage of a 747.

Are other cities looking at us as a leader now that we are moving along on this fantastic project?

David: There's no doubt about it. There are a number of cities, especially in Southern California, that have always looked to L.A. to show the way. And that I suppose it's nice to be in that position, but a big responsibility comes with being in that leadership position. Across the nation, people are seeing Los Angeles step up and not just engage in the rhetoric of green energy but to actually pursue it.

This should put to bed arguments that L.A. is tied to its traditional energy resources, and it is unwilling to diversify its resources. This clearly repudiates those kinds of statements that have been made in the past. But it also shows I think a very, very important point, as well, which is that there is no real distinction between good environmental policy and good economic policy. By pursuing projects such as Pine Tree, we've managed to provide an economic stimulus. We employ people. We train people in a new profession. And it isn't just LADWP folks. There are contractors that are out there working to provide support. So, as we move away from traditional polluting sources of energy to renewable sources of energy, we not only reduce greenhouse gas emissions and provide a better source of energy, as far as pollution is concerned, but we also, in the bargain produce jobs and provide an impetus and cause a great deal of economic activity as well. And we're finding that not just in this project, but in all of the other activities that we're pursuing. Environmental initiatives are economic stimuli as well. This is a model that we're going to see happen throughout the nation. It's what the president's economic stimulus package is largely about. And L.A. is showing the way there, as well.

Heat and Trash and Packaging

As far as the exciting projects that are looking out five to ten years in the future, where do you see us? This is exciting, but I'm sure, ten years from now, we're going to be even more excited from what other renewable energy products you have in store for us. Could you give us a little picture of that?

David: Sure. As we move towards this diversification of our energy resources, it's important that we maintain both diversity, as far as the resources are concerned, and diversity within each category of resources. So, what we're going to be seeing is more wind in the mix, but solar -- pursuing the L.A. solar plan to maximize our use of solar. It is, after all, our most abundant and free energy resource in the City. The fact that it hasn't been explored to its fullest potential is, I think, not a very bright spot for L.A. Again, the mayor has shown tremendous leadership on this issue, so we'll be moving toward solar in a very vigorous way.

And geothermal. Geothermal is really the only renewable

resource that can mimic coal in the sense that it is a continuous, 24-hour power.

Geothermal is the heat underneath the surface of the earth. And by exploring that, we will have a pollution-free resource that will be able to replace coal as we

move away from coal as what is

currently our primary resource. So, we'll also be looking at other technologies, as well, like biomass -- trash to energy. Biomass is also things like garden waste. Twigs and leaves can be utilized to produce energy, and certainly trash. I think that's an area that we have to explore very seriously because we have literally thousands of tons of garbage in our landfills.

As a society, we have to cut back on our trash, and we have to look at packaging very seriously. Even now, any product that you buy, you'll find it's truly packaged excessively. Packages inside of packages inside of packages. And all of that just produces more and more trash. So, we have to look at that as a society. If we can use our garbage to produce energy in a way that doesn't have local polluting impact, that's something we should also consider seriously.

Measure B

You mentioned solar. Could you give me something I can visualize as far as solar energy and what projects are on the horizon?

David: We'll be going out to the community with a series of outreach meetings to obtain input from the public in the wake of the very narrow defeat of Measure B. I think we have to do that because the electorate told us something with respect to Measure B. We all heard the margin of loss was very, very slim. What I heard the voters say during the entire debate about Measure B was that the voters definitely want to see solar. They want to see City-owned solar, just like Pine Tree. And I think most people agree with that position. But there is also room for the private sector. And so we need to now sort out exactly how these programs are going to work, and we have to start off with a series of outreach meetings and go from there.

So no solar farms are in the works.

David: The L.A. solar plan does contemplate 500 megawatts of large solar facilities located outside the City. Five hundred megawatts of solar is a lot.

That's exciting. So, that's actually something that's on paper or being developed?

David: It's on paper. I think it's going to be very exciting for us. As I say, we're seeing already a great deal of interest in the desert, and we'll see what comes of it.

Seeing the wind farm was like our first taste of something real, something physical. It's built. It's not just a dream or rhetoric.

David: Correct.

Thank you very much.

David: Thank you. ■

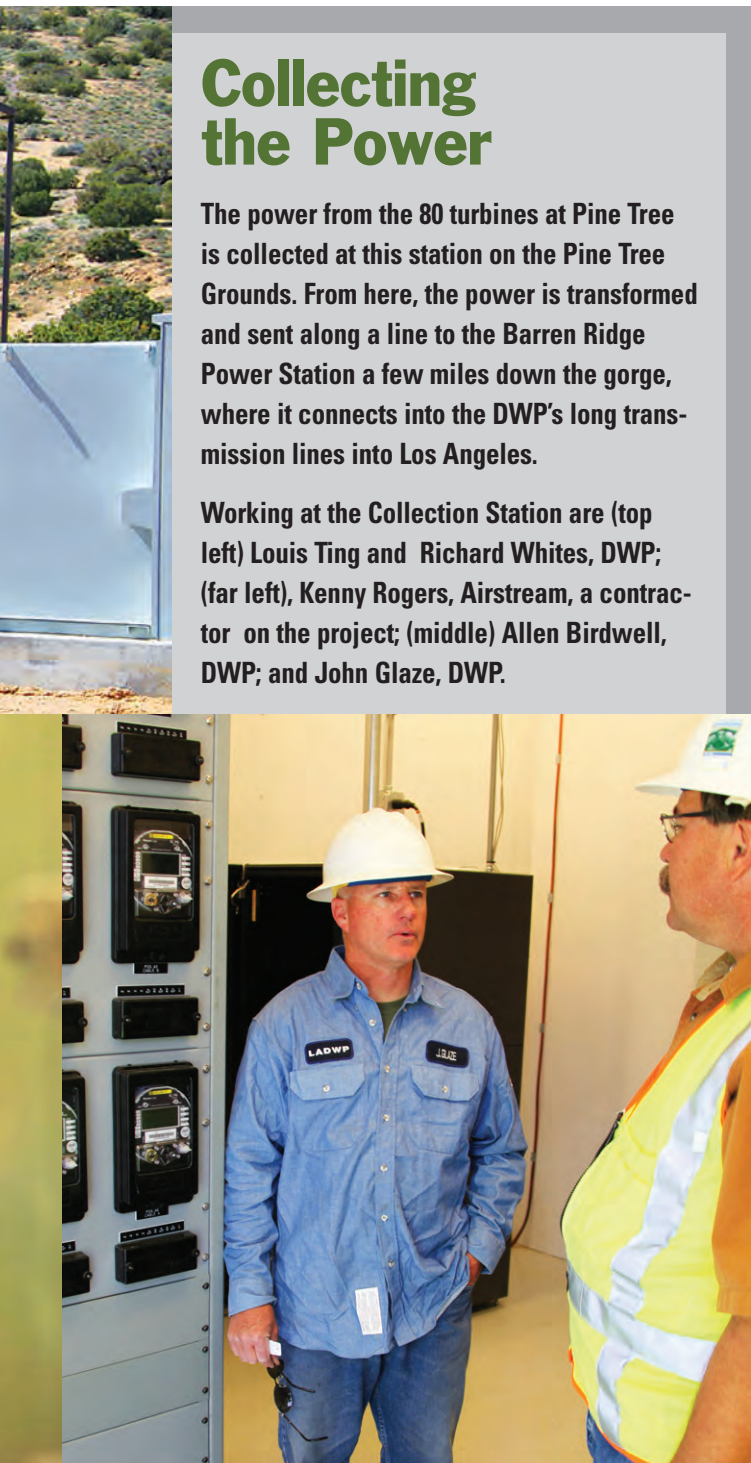


Above: R. David Nahai talks about the mayor's green energy mandates for the next two decades.

Collecting the Power

The power from the 80 turbines at Pine Tree is collected at this station on the Pine Tree Grounds. From here, the power is transformed and sent along a line to the Barren Ridge Power Station a few miles down the gorge, where it connects into the DWP's long transmission lines into Los Angeles.

Working at the Collection Station are (top left) Louis Ting and Richard Whites, DWP; (far left), Kenny Rogers, Airstream, a contractor on the project; (middle) Allen Birdwell, DWP; and John Glaze, DWP.



PART 1, continued from page 9

foundation has 14 rock anchors that go up to 65 feet deep, until they hit rock, and they anchor into the rock. Each turbine has 14 of these anchors.

How long did it take to build each tower foundation, from beginning to end?

Louis: About a week. They have these pre-manufactured forms that are half-shells, and the rebar is prefabricated on site. The rock anchors took the longest time.

And you built 32 miles of road did you say was it?

Louis: About 35, including [the entrance from] Jawbone. That's the first thing we did -- open up the Jawbone Canyon and made the road wide enough for the equipment to come in.

And then we started the second phase, building the roads throughout the site.

Going Live

How many DWP employees are on site?

Louis: I'll mention the Project Management's side of it. There are only three engineers.

Rich: I have a staff of four mechanics and three exempt employees. And I make eight, and Jeff Chamberlain makes nine. And that's the limit of my staff to maintain the park at this point.

And once this is up and running, Rich, and you take over managing the area, how many DWP employees will be up here then?

Rich: Roughly speaking, probably 16.

When do you get the keys?

Louis: When I give them to him. *[They laugh.]*

Rich: That's correct. GE has to finish their acceptance testing for the park to make sure we get reliability requirements. And then the ball really comes into my court.

Louis: And I have to commission the turbines. The clock starts on maintenance when they first start spinning. After they spin for six hours without any faults, I will unofficially turn them over to Rich.

Louis: You're looking forward to it, right?

Rich: Oh yes, this is going to be a great project.

What will your job entail when you do take over?

Rich: We have the Pine Tree Collection Station, which is a 35,000-volt-to-230-kV transmission station down to the Barren Ridge Switching Station, where it intercepts the main line down into Los Angeles. I have the responsibility of maintaining Pine Tree Park, Pine Tree Collector Station and the Barren Ridge Switching Station.

Why Pine Tree Matters

Why is this project important?

Rich: We live in a world where global warming has become something to be noticed. We've seen the price of energy go up, the availability of energy going down, and the demand for energy going up. And we need to be custodians of the

world that we live in. Green power is important. We need to have photovoltaic cells. We need to have alternate energy, renewable energy, and the DWP needs to lead the way.

Sounds like it is leading the way.

Rich: I hope so. I'm happy to be part of it.

This is my first gig as a supervisor for Water and Power, and this is the task I'm allotted.

And how about you, Louis?

Louis: I'll tell you why it's important to me. Rich has mentioned the global issues, but it's important to me because the mayor told us to build it! *[They laugh.]*

But I'm serious because if it weren't for the mayor's directive and Water and Power management's directive, this park wouldn't be built. It's difficult to build a farm this size without this much involvement. It took a lot of effort from everybody, from environmental all the way down to engineering and the support from downtown and the support from local governments. The Bureau of Land Management has jurisdiction over this project, and it was a lot of negotiation with the Kern County supervisors to get this thing going. It took a lot.

This whole area is zoned for farming [agriculture]. To zone this, the zoning had to be changed. You've got to go in front of board supervisor and zone it for wind. And that took a lot of effort.

But they did it.

Louis: Which they did because, again, it's in

everybody's best interest to get wind farms and renewable energy in everybody's neighborhood. It looks good for Kern County; it looks good for Los Angeles.

Does this put L.A. on the map?

Louis: You bet.

After you've had some distance from this project, after you're onto your next project, and you look back on Pine Tree: What do you think you're going to say about it? How do you think you're going to feel about it?

Louis: I'm going to bring my kids here. I'm going to show them, "This is what Daddy has been doing for the past year." This is something I'm going to pass down to my family.

My dad's already asked me, "When can I come onsite to look?" He's seen them on TV, but when you go in person, like you guys saw today, it's a lot more impressive.

The sound, and that's something that we won't be able to really convey very well in a print article, but it's impressive when you're standing underneath those propellers. How did you feel when you first heard that sound?

Louis: When I heard the first one spin like that, I was in awe."

Did you stand back a little bit?

Louis: No, I stood right below it. It was awesome. ■

PART 2, continued from page 11

and it gives it both speed and direction. You want to be able to get the blades to get the maximum efficiency, or maximum generation possible. It also can help you with when you get to too high a wind. It stops the integrity.

We found that out. On our first attempt to tour the facility, you had to shut it down because of the wind.

John: It was blowing at 90 miles an hour.

Bob: You do not want to have that.

Expansion

You have 80 towers built now.

Bob: Yes.

Are there plans for more than 80 towers at the Pine Tree site?

Bob: Possibly.

John: We're looking at some options.

Bob: We're looking for some small expansion. That's under evaluation right now.

John: Within our permit conditions and things that we need to, you know, work through.

Harnessing the Night Wind

Tell us about the wind surveys. How did you choose the specific locations for each turbine tower?

Bob: We set up a number of [meteorological] towers up there that collected data at different locations, and then they take that data and create a model. They look at the terrain, and they try to come up with the specific locations that will give you the maximum capacity. You're looking for as high a capacity factor as possible, obviously. We looked for I think about 32 percent overall for the Pine Tree project, which is pretty good.

Now what does 32 percent mean?

Bob: It means it will produce 32 percent of maximum capacity. If you have 80 turbines at 1.5 megawatts, that's 120 megawatts. So if you think over a period of, say, one year's time, you'll be able to generate 32 percent of that capacity. Some days you'll be much lower. Some days you'll be close. There will be a few days when you'll be right at 120.

Nazih: You're not going to be generating 1.5 megawatts all year 'round, 24 hours of the day.

Bob: Typically it's at night when it does. I'll give you an example. I came in this morning and we

were at more than 26 megawatts with the turbines we had on. And by ten o'clock it dropped down to about four or five.

Nazih: The maximum capacity for the wind is around midnight.

Really?

Nazih: Yes.

Are there thermals that come up from the ground, too? Is that any significant amount?

Bob: Not that I'm aware of, really. We will see winds probably pick up this afternoon. Typically in the afternoon, you'll get a little higher wind, around two, three or four o'clock. As you get into the evening, it gets higher. Midnight to six in the morning, you're going pretty high.

How do you store that nighttime energy?

John: There is no battery technology to store that when you don't need it. So instead, when you don't need that power, you then use that to pump water up to a higher elevation, and then when you need it the next day, then you use those generators. That's how Castaic works. That water then will fall back from Pyramid Lake back down to Castaic.

Amazing concept.

John: To meet those peak demands [during the day].

So the energy from Pine Tree gets stored as mechanical energy and then is transferred back to electrical energy at the Castaic generators.

John: You got it.

Bears and Snakes and Snow

What unusual challenges have you faced?

Bob: The biggest issue with the wind farm was that it's a new site and there are a lot of environmental issues out there that need to be satisfied.

Perhaps because of its ruggedness it wouldn't be a place you would traditionally put a power generation plant.

Bob: You prefer a flatter terrain. But obviously the wind is the most important thing. You must have the wind, and you do have to have transmission access.

Nazih: But the other hand, the wind was a problem during construction.

Bob: Oh yes, yes. You can't run a crane or go up the towers if it's too windy.

Nazih: So the weather was a problem. And there's the snow.

Snow?

Bob: Winter comes to that location.

I can't even imagine.

Nazih: Weather was one of the problems when we were building this. There were a lot of delays due to weather, rain and snow.

Bob: Lesson learned. We've got to pave those roads where we have very steep slopes for our operations people, because what we have now is just too slippery in bad weather conditions.

John: Bob is a good example for some of these other new guys who are starting here at DWP. There's very little appreciation for the day-to-day things that he encounters and deals with. And a lot of that is just problem-solving. Every day there are issues that come up. Bob is dealing with landowners. The environmental groups that are out there that are interested. There are Native American groups that are interested in this particular area, the Bureau of Land Management, the Department of Fish and Game.

And Kern County.

John: Kern County folks out there -- the Kern County Air Pollution Control District -- represent a lot of this.

Bob: We have an area there with endangered species with the Desert Tortoise. We had to deal with that in a proper manner.

Sounds amazing it got built in the first place.

Bob: Sometimes it was not easy, but we found a way each time.

John: And we had biologists in the area at all times for indigenous species, for the tortoises, for snakes, birds, and bears. There were a couple of bears that kept coming into our site.

No kidding.

Nazih: And they would come in at nighttime and take all the food.

Why Pine Tree Matters

Has this changed any of your lives?

Bob: Obviously, we don't have a facility like this in the department, and all this wind turbine generator technology is new. So it's been a learning experience for the department. And it's a different type of facility than what we traditionally see here in generation.

Has it changed your life or your concepts of renewable energy?

Bob: I don't know if it's changed my life, other than I spent a lot of time here. *[He laughs.]* It's

a fast-moving project, and there are always issues coming up on a daily and weekly basis that need to be addressed. So it's pretty rigorous in that respect.

As far as renewable energy is concerned, it's an opportunity to capture that. I know, from an air quality point of view, it's as perfect as you can get, just about. And you don't have any carbon footprint on it as far as that's concerned.

What have you learned?

Nazih: A lot. I didn't know much about wind energy until we got involved with this project. And now I'm thinking about wind energy in my home. You know if I can put a windmill in my home that would be great.

So it's changed you.

Nazih: It's changed me, yes. And now I'm looking at Websites on wind energy. I'm looking at what they're doing in Europe. They are ahead of the United States on wind energy. They're putting a lot of these wind turbine generators in the oceans now. And so it's broadened my knowledge about renewable energy.

Is it exciting to you?

Nazih: It is very exciting.

Bob: It has a positive nature to it because the end result is that it's something that could benefit the society that we live in.

And this is quite a change from all the other projects you have been doing, which have been standard.

Bob: You get into a mindset that you have to do some learning as you go along. Are you prepared to do the learning? I knew nothing about wind turbines when I started this project, so I've moved along the way of knowledge.

Now you might be one of the country's experts.

Did you think back when you started your career and trained to do this, did you ever think at the end of your career as you retired you'd be working on the wind?

Bob: Nope.

You have a new career.

Bob: It's a nice way to leave. The satisfaction is we're close to successfully completing it.

Thanks for your time!

Bob: Sure.

Nazih: You're welcome. ■