



SunLine Transit Agency: Driving a hydrogen-fuelled future

By [Joanna Sampson](#) on Jun 24, 2020 | [AZ Translate](#) ▼

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If it's zero emission, SunLine Transit Agency wants to operate it. Driving a clean fuels agenda for more than 25 years, the Californian bus operator moves nearly five million riders annually in the Coachella Valley region, from Desert Hot Springs through to Palm Springs, via its zero emission fleet.

The progressive and passionate alternative fuels supporter currently has 17 hydrogen fuel cell buses and four all-battery-electric within its fleet, with a further eight fuel cell buses on the way.

"We're technology agnostic," SunLine's CEO and General Manager Lauren Skiver enthuses. "We've developed a plan to go completely hydrogen by 2035. When I say completely, we'll probably still have about 18 battery-electric buses in there. But the reason for that is when you're scaling up hydrogen, you need to be able to pace the production side to the bus side. The production side is expensive."

To keep costs down, SunLine has invested in its own hydrogen refuelling infrastructure and makes its own fuel for roughly \$8 per kg. Skiver tells H2 View that if she had to buy hydrogen fuel on the open market, it would cost roughly \$30 per kg, which might explain why the agency is only one of a few in California using fuel cell buses.

"For more fleet operators to move to hydrogen, there's got to be lower cost, easier constructed solutions on the production side. Fleet operators want the security of fuel on their property versus driving each vehicle to a station. When you start to find ways to bring hydrogen to fleet operators' properties in a way that they can afford and makes sense, more fleet operators will move to hydrogen," Skiver says.

Formed in 1971, SunLine's mission to incorporate clean fuels into its fleet began in 1994, when it became the first public transit fleet in the US to park all of its diesel buses and switch overnight to a 100% compressed natural gas (CNG) fleet.

Because of its experience with alternative fuel technology, SunLine was chosen by the US Department of Energy to coordinate several projects designed to advance the commercialisation of hydrogen as a transportation fuel. This mammoth undertaking culminated in the April 2000 grand opening of the world's first hydrogen generation, storage and fuelling facility built by a public transit agency.

SunLine continues to be at the forefront of clean fuel initiatives, recently working in partnership with Nel to upgrade its onsite hydrogen station. The new 900kg per day station comprises an electrolyser hydrogen production plant, supporting compression and storage equipment and two 350 bar fuelling dispensers. But it doesn't stop there for SunLine, the agency is already driving its next big project: building a solar micro grid for hydrogen.

Earlier this month, H2 View caught up with Skiver to find out more about SunLine's exciting plans for hydrogen.

Thanks for your time today Lauren. Why do you think hydrogen is the way forward for heavy-duty applications?

Right now, we've got 17 hydrogen fuel cell buses and four battery-electric. We find that the all battery-electric buses do not have the range that we need nor the refuelling timeframes that work well for us. An opportunity charge for a bus is two to four hours, a complete charge could be up to eight. Hydrogen is much more flexible for the type of service that we run here.

I think it's the way we will have to move from a power density and range aspect. I personally don't see heavy-duty operating efficiently under the battery technology types that we have right now.

For some of the smaller classes and light duty cars, battery will probably be what is the most cost effective and efficient way to move a smaller vehicle. But as you get up into the classes and the work that that vehicle needs to do, the number of batteries you need could outweigh the benefit. Also, the range you need may never be accomplished with batteries which opens up new possibilities for hydrogen.



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SunLine produces its own hydrogen to fuel its fleet. How do you do that?

We are one of two transit operators producing our own hydrogen. For almost 18 years, we did that through steam methane reformation (SMR). We used biogas, so bioCNG from landfill so it was renewable. At the time we were producing about 180kg per day, which wasn't enough, and we only had five fuel cell buses at the time.

We made the decision to go fuel cell several years ago and we were successful in getting an almost \$9m grant from the state of California. We now have a 900kg per day electrolyser operating. This is the largest in the US for transit or any kind of transport or fleet operator in North America, and it's been up and running for about five months now.

We worked in partnership with Nel on this and it was the first time Nel had ever done a project like this in transit. When you think about a \$9m plant on a transit facility, this is a major undertaking. Right now, we're buying grid power which is expensive and is the main reason for our high kg costs. That is why we are driving our solar project so quickly. We really want to get to both the cost effective efficiency of using renewable solar and also making it a green product from well to wheel. Our goal is to produce hydrogen at under \$5 per kg.

Could you tell us more about the solar project?

We are in the process of buying 10 acres of land to build a solar farm. In the first phase, that solar farm will provide 4MW of power to run our electrolyser and to store some of that electricity in a battery pack configuration that we plan to put next door for the electrolyser. The second phase will be to update our public station.

We have a public station and we sell CNG and we have a hydrogen dispenser on that first station. At the moment, it's 350 bar which is really only useable by buses. Our second phase will be to upgrade that public station to 700 bar so that the light duty and heavy-duty vehicles we see being developed by the likes of Nikola, Honda and Toyota could use that station.

The third phase would be to increase our battery storage capacity for that solar farm. The fourth phase would be to build a truck stop across the street from our facility where we could sell hydrogen and renewable electricity to any class of vehicle that was travelling along the Interstate 10 (i10).

We happen to be on the i10 corridor, which is a major corridor across the US, and we're 160 miles from downtown LA. What we plan to be is the truck stop of choice for vehicles delivering goods or moving goods between Arizona and California. It's a good opportunity stop for let's say a Class 8 over the road truck to stop and fill before they have to get into the congestion of LA, which could mean that they don't have enough fuel to get all the way to the port.

The future for SunLine is selling clean hydrogen, so it's totally renewable, made from our solar farm. We could also potentially sell clean electricity for battery-electric vehicles that are travelling along the i10 too.



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Wow, that all sounds really incredible. You're clearly a passionate advocate for hydrogen and alternative fuels too. Where does your passion come from?

I've got so inspired by what SunLine is doing that I'm actually going to school for an environmental science degree now. I really want to work in this space, whether it's in transit or in something else that drives fleet operators to understand the benefits of zero emission technology.

I would say I've always been interested in the environment. The work SunLine is doing is just so groundbreaking you can't help but be passionate when you get to know the agency.

Why do you think California is leading the way in the US on hydrogen and fuel cell technology? What needs to be done to see other states deploying this technology?

California has used introduced regulation to meet its climate goals. It's difficult to get fleet operators to look at a more expensive solution. Zero is not cheaper, not on the fuel production, energy production or on the vehicles themselves.

If you try to take a fuel cell bus and compare it to a diesel bus and try to cost it out, it's never going to cost out. I think that's what individuals and companies have done to prevent this kind of technology from going forward. There's always been this cost aspect that we concentrate on more than the environmental aspect.

California decided that the environmental aspect outweighs the cost and have directed it through regulation. The Innovative Clean Transit regulation, passed in California, requires all bus operators to be zero emission by 2040.

Now, California is working on what's called the ACT – Advanced Clean Truck – regulation, which will require all trucks, Classes 2-8, to be zero emission. That is huge because if you think about a Class 2 truck, you're talking about a small box truck which might be used by UPS or Fedex. This goes all the way to a Class 8, which is an over the road heavy-duty vehicle.

Is there anything you feel is missing in the hydrogen space right now?

Those that produce components for hydrogen, and more importantly those that produce infrastructure for hydrogen, need to start paying attention to what the benefits could be for a lower cost, smaller scale production. I believe what's missing in the hydrogen world right now is this starter set that can produce 200-700kg per day at a low cost, something that could be dropped on a facility and begin producing.

I understand that hydrogen producers see big volume as being where the money is at, but if they could see how smaller volumes, lower cost solutions to production could be a new source of customer, we could accelerate commercialisation.

The history of hydrogen has always been big productions, whether for fertiliser plants or industrial use. The community has been kind of slow to switch on how these smaller scale operations could still be of value from a financial aspect to hydrogen infrastructure producers or gas producers.



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Finally, if you could leave our readers with one hydrogen-related message, what would that be?

We need more hydrogen and we need more solutions. The vehicle side of hydrogen is already moving, but the production side needs to catch up. Fleet operators don't like to buy fuel at stations, they like to have a station on their property. When you start to find ways to bring hydrogen to their property in a way that they can afford and makes sense, more fleet operators will move to hydrogen.

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