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<https://www.greencarcongress.com/2021/09/20210912-fs.html>) Frost & Sullivan: Li-ion battery materials market to reach \$51.60B by 2027 from \$18.75B in 2020; 15.6% CAGR (<https://www.greencarcongress.com/2021/09/20210912-fs.html>) Engineered E. coli could make carbohydrates, renewable fuel, from CO2 (<https://www.greencarcongress.com/2021/09/20210912-newcastle.html>) <https://www.greencarcongress.com/2021/09/20210912-newcastle.html>)

Iwatani, SG H2 & City of Lancaster to launch green hydrogen transportation eco-system (<https://www.greencarcongress.com/2021/09/20210912-sgh2.html>)



<https://www.greencarcongress.com/2020/10/20200923-342-index.html>

12 September 2021 (<https://www.greencarcongress.com/2021/09/20210912-sgh2.html>)

Energy company SG H2 Energy; the City of Lancaster, California; and Iwatani, Japan's leading hydrogen industrial gas company and a developer of hydrogen refueling stations (HRS) in California, are launching (<https://www.sgh2energy.com/press-release-historic-signing-iwatani-sg-h2-city-of-lancaster>) California's first closed-loop green hydrogen ecosystem for transportation.

In May 2020, SG H2 announced it was bringing the world's biggest green hydrogen production facility to Lancaster (earlier post (<https://www.greencarcongress.com/2020/05/20200521-sgh2.html>)). The plant will feature SGH2's gasification technology, which uses biogenic waste, biomass and recycled water to produce carbon negative hydrogen.

The City of Lancaster, host and co-owner of the green hydrogen production facility, will facilitate the supply of guaranteed feedstock of waste paper, reducing methane produced by landfill and saving the City between \$50 to \$75 per ton in landfilling and landfill space costs.

SG H2 Energy says that its green hydrogen reduces more CO₂ emissions than green hydrogen produced using electrolysis from 100% renewable power and is 4-5 times cheaper to produce. According to a preliminary lifecycle analysis by Lawrence Berkeley National Lab, for every ton of hydrogen produced, SG H2's process displaces up to 30 tons of carbon dioxide—13-19 more tons of carbon dioxide avoided than other green electrolytic hydrogen.

SG H2's hydrogen production facility employs a stacked modular design built for rapid scale and linear distributed expansion at lower capital costs. Production does not depend on weather conditions and does not require as much land as solar- and wind-based projects, nor excessive water resources.

The SG H2 Lancaster plant, to be located on a 5-acre site zoned for heavy industry at the intersection of Avenue M and 6th Street East, is scheduled to break ground in Q1 2022 and begin production in Q3 2023. It will produce up to 11,000 kilograms of green hydrogen per day, and 3.85 million kilograms per year at full operation in baseload capacity of 350 days per year or 95% capacity factor. The facility will process 42,000 tons of recycled waste annually, employ 35 full-time employees once operational and provide over 600 jobs during construction.

In Brief

[Bosch to invest more than €400M in its semiconductor fabs in 2022 \(<https://www.greencarcongress.com/2021/10/20211030-bosch.html>\)](https://www.greencarcongress.com/2021/10/20211030-bosch.html)

[DOE: California, Washington, and Hawaii had the highest share of transportation-related CO2 emissions in 2018 \(<https://www.greencarcongress.com/2021/10/20211026-fotw.html>\)](https://www.greencarcongress.com/2021/10/20211026-fotw.html)

[Rybnik orders 16 Solaris electric buses \(<https://www.greencarcongress.com/2021/10/20211025-rybnik.html>\)](https://www.greencarcongress.com/2021/10/20211025-rybnik.html)

[Study finds short-haul flights in Europe a key contributor to aviation emissions \(<https://www.greencarcongress.com/2021/10/20211012-shorthaul.html>\)](https://www.greencarcongress.com/2021/10/20211012-shorthaul.html)

[Solaris lands €15+M contract for 30 electric buses for Genoa, Italy \(<https://www.greencarcongress.com/2021/10/20211012-solaris.html>\)](https://www.greencarcongress.com/2021/10/20211012-solaris.html)

[Geely aims to have 5,000 battery swapping stations in China by 2025 \(<https://www.greencarcongress.com/2021/09/20210930-geely.html>\)](https://www.greencarcongress.com/2021/09/20210930-geely.html)

Iwatani will use SG H2's greener than green hydrogen to supply both existing and new refueling stations rolling out across the state. The California Energy Commission (CEC) and Air Resources Board (CARB) have identified green hydrogen as an important source of zero emissions energy critical to reaching California's carbon reduction goals.

California Executive Order (EO B-48-18) tasked these agencies to achieve a goal of 200 hydrogen refueling stations by 2025. Currently there are 127 retail HRS in development in the state. The California Fuel Cell Partnership has a goal of reaching 1,000 HRS by 2030. CARB requires that at least 33% of all hydrogen used in HRS come from renewable green hydrogen sources.

According to the multi-year Off-Take Hydrogen Supply contract, Iwatani will purchase a large portion of SG H2's green hydrogen from the Lancaster plant, where tube trailers will be filled with compressed gaseous hydrogen at high pressure and delivered directly to HRS throughout Southern California. Iwatani's internal Logistics Team will be responsible for managing the transport of hydrogen from Lancaster to their HRS for storage and refueling into both light- and heavy-duty fuel-cell vehicles.

SG H2 is now kicking off the project's front-end engineering and design (FEED) phase. A consortium of global companies and top institutions have joined with SG H2 and the City of Lancaster to develop and implement the Lancaster project, including Fluor, ABB, Integrity E&C, Millenium, Air Liquide, Munich RE and Stork.

Fluor, a global engineering, procurement, construction (EPC) company, which has best-in-class experience in building large-scale hydrogen-from-gasification plants, has been awarded the contract to perform the front-end engineering and design work and Stork, a global O&M company with strong credentials in maintaining and operating gas infrastructure and production facilities worldwide, is selected to serve as the operations and maintenance contractor for the Lancaster Project.

ABB, a global technology company operating in more than 100 countries, has been selected to partner across electrical, instrumentation, automation, security and telecommunications systems for this green hydrogen initiative.

SG H2 will provide a complete performance guarantee of the Lancaster plant by issuing a total Output Performance guarantee of hydrogen production per year, underwritten by Munich RE, the largest reinsurance company in the world.

Posted on 12 September 2021 in Fuel Cells (https://www.greencarcongress.com/fuel_cells/), Hydrogen (<https://www.greencarcongress.com/h2/>), Hydrogen Production (https://www.greencarcongress.com/hydrogen_production/), Hydrogen Storage (https://www.greencarcongress.com/hydrogen_storage/), Market Background (https://www.greencarcongress.com/market_background/) | Permalink (<https://www.greencarcongress.com/2021/09/20210912-sgh2.html>) | Comments (4) (<https://www.greencarcongress.com/2021/09/20210912-sgh2.html#comments>)



Comments



It will be interesting to see what the delivered price to the pump is. It is far easier to set up closed loop zero for hydrogen than for BEVs.

Posted by: Davemart (<https://profile.typepad.com/6p011156fc08021970b/>) | 12 September 2021 at 03:54 AM (<https://www.greencarcongress.com/2021/09/20210912-sgh2.html?cid=6a00d8341c4fbe53ef026bdef038b7200c#comment-6a00d8341c4fbe53ef026bdef038b7200c>)



Just to put some scale to this, the 42,000 tons of waste is less than 4 US train loads of coal. I was out taking pictures in northern Nevada today and I have already seen 2 train loads of coal go by. And a ton of coal will have more energy than a ton of waste. Don't get me wrong. I think that coal is absolutely the worst source of energy and I have a dislike of landfills. Doing about anything reasonably clean that generates power from waste is better than a landfill. But this is not going to magically make cheap hydrogen available in any large quantity. Also they are using waste paper that can be recycled into other paper products. Also not sure how this is greener than electrolysis. Are they also capturing the CO2?

Posted by: sd (<https://profile.typepad.com/6p0111686424aa970c/>) | 12 September 2021 at 02:23 PM (<https://www.greencarcongress.com/2021/09/20210912-sgh2.html?cid=6a00d8341c4fbe53ef027880482be5200d#comment-6a00d8341c4fbe53ef027880482be5200d>)

 Sydney Krueger

[Gevo acquires Butamax patent estate for the production of renewable isobutanol and derivative renewable fuel products](https://www.greencarcongress.com/2021/09/20210927-gevo.html) (<https://www.greencarcongress.com/2021/09/20210927-gevo.html>)

[Electric Last Mile Solutions secures binding order for 1,000 units as start of production begins](https://www.greencarcongress.com/2021/09/20210923-elms.html) (<https://www.greencarcongress.com/2021/09/20210923-elms.html>)

[Oshkosh invests in Carnegie Foundry to build upon autonomy and robotics capabilities](https://www.greencarcongress.com/2021/09/20210921-oshkosh.html) (<https://www.greencarcongress.com/2021/09/20210921-oshkosh.html>)

[Chevron, Caterpillar to demonstrate hydrogen locomotive prototype](https://www.greencarcongress.com/2021/09/20210909-chevrontcat.html) (<https://www.greencarcongress.com/2021/09/20210909-chevrontcat.html>)

[Helbiz partners with Pininfarina to launch 'Helbiz One' e-scooter](https://www.greencarcongress.com/2021/08/20210817-helbiz.html) (<https://www.greencarcongress.com/2021/08/20210817-helbiz.html>)

[DOE awards Nikola \\$2M to research autonomous refueling for hydrogen stations](https://www.greencarcongress.com/2021/08/20210813-nikola.html) (<https://www.greencarcongress.com/2021/08/20210813-nikola.html>)

[NFI and Robotic Research to bring automated driving technology to North American transit agencies](https://www.greencarcongress.com/2021/08/20210813-nfi.html) (<https://www.greencarcongress.com/2021/08/20210813-nfi.html>)

[Gevo restarts production at Luverne renewable fuels facility; isobutanol for aviation fuel and gasoline](https://www.greencarcongress.com/2021/08/20210807-gevo.html) (<https://www.greencarcongress.com/2021/08/20210807-gevo.html>)

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[MAN Energy Solutions and ANDRITZ Hydro to develop projects for green hydrogen from hydropower](https://www.greencarcongress.com/2021/07/20210730-man.html) (<https://www.greencarcongress.com/2021/07/20210730-man.html>)

[Exro selects Mesa, Arizona for US HQ; Coil Driver](https://www.greencarcongress.com/2021/07/20210728-exro.html) (<https://www.greencarcongress.com/2021/07/20210728-exro.html>)

[Parkopedia to provide upgraded premium parking services to Volkswagen of America](https://www.greencarcongress.com/2021/07/20210728-parkopedia.html) (<https://www.greencarcongress.com/2021/07/20210728-parkopedia.html>)

[BAAQMD funds 7 zero-emission tractors](https://www.greencarcongress.com/2021/07/baaqmd-funds-7-zero-emission-tractors.html) (<https://www.greencarcongress.com/2021/07/baaqmd-funds-7-zero-emission-tractors.html>)

This is great and we need more H2 at the California stations. This project could be replicated all over the US. This supply could power some of LA metro's 2,200 buses with 100% clean hydrogen and fuel cell buses! I wonder if SGH2 is investing in a liquefier? We should encourage this. Density wise it is much better to transport h2 via liquid tube trailers especially if we want to bring it up to N Ca which is 300 or so miles. Regardless, even if it is gaseous this will be fantastic supply for S California and I can't wait to celebrate commissioning in 2023!

Posted by: Sydney Krueger

(<https://profile.typepad.com/d17803323353580557/>) | 13 September 2021 at 07:03 AM (<https://www.greencarcongress.com/2021/09/20210912-sgh2.html?cid=6a00d8341c4fbe53ef026bdef074cd200c#comment-6a00d8341c4fbe53ef026bdef074cd200c>)



The electrolysis processes presently being used for large scale production of "green H2" have - with a big portion of good will - an efficiency of 70% and hence, a loss of 30% of RE. Apart from being horribly expensive, fuel cells have an efficiency rating of 60 %. 60% of 70% progresses to an overall intermediate efficiency of 42%. IOW 58% losses of the original RE. At this point, the H2 is still at the generating plant. Now the H2 has to be transported to a filling station.

E. g. the most common transportation method is via a truck; in this case the H2 has to be pumped into - and compressed in the tank of the truck. In this step, another 10 to 12% losses of energy occur.

The energy the truck uses for the transportation - either electric or fossil - depending on the distance, reduces the overall efficiency further.

Upon arrival at its destination, the H2 is pumped from the truck to tanks of the filling station resulting in another loss of ca. 12%.

Now the H2-vehicle fills up at the filling station; same story - pumping and compressing =s further -12 %. With lots of luck, the overall efficiency will end up somewhere between 15 and 20%. For on road mobility, fuel cell driven vehicles are nothing more than a bad joke wasting precious RE that has been produced with great effort via solar or wind etc..

I cannot, by the best of will, understand proponents of H2 and fuel cells.

Posted by: yoatmon (<https://profile.typepad.com/yoatmon/>) | 14 September 2021 at 06:44 AM (<https://www.greencarcongress.com/2021/09/20210912-sgh2.html?cid=6a00d8341c4fbe53ef027880488c44200d#comment-6a00d8341c4fbe53ef027880488c44200d>)

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