

# PGRS TRACKIN'

**Newsletter of the Piedmont Garden Railway Society**

**January 2022**

**Editor: Scott Williams**

'Once, there was a time when Fire Breathing Dragons roamed the Earth.'



Tweetsie Christmas





Rocky Cove RR Polar Express, at the NC Arboretum's WinterLights Festival



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Pete gendron forwarded this article along:



Railroads & Solar Power: You Ain't Seen Nothing Yet

Squeezing more solar power into the German railroad system is the aim of a new study, and the US railway industry could take a page or two from that book.

By Tina Casey

Renewable energy has been quietly seeping into the US railroad industry, but the pace has been achingly slow. Things could pick up if a new solar power research project in Germany pans out. It aims for a sustainability twofer, by leveraging the built environment of railroads for direct electrification.

### More Solar Power For Cleaner Rail Transportation

Rapid decarbonization is already within reach in the area of commuter rail transportation, where many systems are electrified through the local grid. All you have to do is replace fossil power plants with solar power or other renewables, and maybe add some bulk energy storage to boot.

That's all well and good, but the German research project is looking to tap existing railway infrastructure for generating direct-to-railroad electricity from solar panels. By feeding electricity directly into the railway system, they anticipate the benefit of avoiding energy loss during transmission, as well as creating new opportunities for siting solar arrays.

The new research could also help resolve railway electrification issues here in the US, where diesel-electric locomotives still do the heavy lifting for long distance freight and passenger transportation (more on that diesel-electric thing in a second).

### More Solar Power For Railroads, Somehow

The new research project comes under the umbrella of the German Center for Rail Traffic Research at the Federal Railway Authority, which has tasked the firm TÜV Rheinland with investigating new opportunities to deploy solar power in and around railway infrastructure.

That is a tricky task, partly because Germany already has a lot of solar power on its hands.

“Because rail transport is heavily electrified and already uses a lot of renewable energy, it already has a favorable greenhouse gas emissions balance when it comes to consumption,” TÜV Rheinland observes, while emphasizing that the research project aims to improve on that picture.

TÜV Rheinland project manager Jürgen van der Weem expands on that theme.

“If it turns out to be possible to generate energy along the widely ramified railway electrification system and feed it in directly, thereby making better use of existing infrastructure and reducing energy losses through multiple conversion and transport, the rail mode of transport could further improve its greenhouse gas balance,” he explains.

The project aims at various types of infrastructure along railroad rights-of-way, such as integrating solar panels into track beds, or generating solar power from noise barriers equipped with PV systems.

## Electric Locomotives For The US

Regardless of where the solar power is coming from, the stipulation is that railroad PV systems will need to tie directly into Germany’s 15-kilovolt overhead network.

The results of the research project should be available soon. The team is looking at a 14-month timeline, though apparently they anticipate that some regulatory barriers will have to be removed or adjusted before their vision of direct-to-railroad solar power becomes reality.

US railways have a much longer row to hoe when it comes to integrating renewables, but there are signs that a change is coming, and it could come fast.

Rather than electrifying entire rail lines, much of the activity in the US has been focused on electrifying the locomotives.

Our friends over at Lawrence Berkeley National Laboratory point out that the US actually has a head start in that regard. Practically the entire fleet of locomotives in the US runs on diesel-electric technology. They deploy diesel fuel to power an on-board generator, which provides electricity for motors that drive the wheels. It’s a long story, but diesel-electric technology took hold in the US as a more cost-effective alternative to coal-fired steam locomotives, and they never lost their grip.

Substitute batteries for the diesel fuel, and Bob’s your uncle. The idea would be to hitch the battery to locomotives on a converted tender car.

The Berkeley team also points out that the centralized nature of the US rail system would help trim the cost of installing battery charging stations at key locations. From there it’s just a matter of feeding the charging stations with electricity from solar arrays and other renewable resources.

“Improved battery technology plus access to cheap renewable electricity open the possibility of battery-electric rail. Here we show that a 241-km range can be achieved using a single standard boxcar equipped with a 14-MWh battery and inverter, while consuming half the energy consumed by diesel trains,” the Berkeley Lab team explained.

As for the all-important cost factor, they have that covered, too:

“At near-future battery prices, battery-electric trains can achieve parity with diesel-electric trains if environmental costs are included or if rail companies can access wholesale electricity prices and achieve 40% use of fast-charging infrastructure. Accounting for reduced criteria air pollutants and CO2 emissions, switching to battery-electric propulsion would save the US freight rail sector US\$94 billion over 20 years.”

### Solar Power, Coming Soon To A Railroad Near You

To the extent that shippers and their customers desire the form of transportation with the lowest carbon footprint possible, battery-powered locomotives appear to have the edge over electric trucks, especially when you throw in the carbon footprint of highway repair and that thing about tire wear and tear.

While Berkeley Lab tries to convince the railroad industry that retrofitting diesel-electric locomotives with batteries is a good thing, some are not waiting around for that.

The Pittsburgh firm Wabtec, for example, recently launched an all-electric locomotive on its maiden run. The idea is to pair the new locomotive with the company's latest generation of fuel efficient diesel locomotives, which is kind of not the same thing as an all-electric train. However, Wabtec still expects significant fuel savings from the configuration. Solar power could come into play depending on where the charging stations are located, and the railroad industry could further shrink its carbon load by expanding its use of biodiesel.

Another approach is coming from a project called Solar Train, which started off as a DIY-level venture in 2016 and now has the support of several railroad industry stakeholders. Solar Train involves layering solar panels on top of rail cars, which fits right into the direct-to-railroad solar power model.

Rounding out the solar power angle is the use of fuel cells in locomotives, but only to the extent that the hydrogen comes from renewable sources instead of gas or coal, using solar or other renewables to power the extraction process.

So far, activity in the fuel cell locomotive field has been slow to take off in the US, but one project under way in California indicates that switcher locomotives could be first out of the box. Switchers run in freight yards, and curbing pollution from freight yards and other shipping operations is a priority in the environmental justice movement, so stay tuned for more on that.

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### **MEMBER PHOTOS:**

My Uncle snapped this photo in early December up at Strausburg PA.:





Bill H. sends this photo with this copy....

“In the spirit of ‘There is a prototype for everything.’ Think about this picture whenever you think that your models look bad.”



I found this ‘Speeder’ surfing the internet....





Gordon Rittmeyer forwarded on photos of their train display this year at Deerfield:

“...maybe some of the members would enjoy seeing the Christmas display we have set up at Deerfield Retirement Community Center. One of the trains and track were donated by Joe Ruppe. The buildings were crafted by woodworkers here at Deerfield.

Gordon













For any Game of Thrones fans...you'll get this.





Please send any idea, project, photo, something you found surfing on the Internet, etc., no matter how great or small they may be to your newsletter editor. We all love trains so...if it's about trains, and you've got it on your computer, chances are you won't be the only person who might enjoy viewing it.

Send your photos to: [srwavl@outlook.com](mailto:srwavl@outlook.com)

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### Membership:

Please consider sharing this newsletter with friends who might be interested and if they wish to become members ask them to contact our PGRS Secretary/Treasurer for a membership form.

Don Watson  
125 Mistletoe Trail  
Hendersonville, NC 28791

[docwatson@morrisbb.net](mailto:docwatson@morrisbb.net)

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### Train Lovers Luncheons:

The Asheville Train Lovers Luncheons on every 2nd Thursday of the month at the Post 25 restaurant in Arden, NC at 11:30.

Greater Greenville Train Lovers Luncheons for many months now. As before they are on the first Tuesday of every month at the A&P Restaurant in Greer starting at 11:30 AM.

Columbus Luncheons at Rural Seed have started up again at 12:00 on the Third Thursday of each month.

Please let Scott Williams know your time and place when you're ready to be posted in the Newsletter.

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**Businesses associated with our club:**



Garden Railroad Design  
Old Trains Wanted

## Jim's Train Sales

O & G Gauge New & Used Trains

**Jim Hendley**

**Etowah, North Carolina 28729**  
*Lionel, MTH, USA Trains, PIKO, LGB  
Bridgwerks Power Supplies, Bachmann  
Split-Jaw Rail Clamps, O & G Gauge Track*

Email: [jhh1218@att.net](mailto:jhh1218@att.net)  
Phone: (828) 891-7570  
Fax: (828) 890-3346

**\*\* Jim Hendley has moved.** To reach him use the following number:

**828-333-2523** and if the email above does not work try [hendleyjim4@gmail.com](mailto:hendleyjim4@gmail.com)



**Peggy Keyes**  
Owner / Chief Conductor  
[RightTrackTrainMuseum@gmail.com](mailto:RightTrackTrainMuseum@gmail.com)  
828/625-5551

**The Right Track Toy Train Museum**  
A non-profit museum to benefit Pancreatic Cancer  
research  
2414 Memorial Hwy (Rte 64/74)  
Lake Lure, NC 28746  
Find us on Facebook!

**Peggy's Facebook** page has more information. Apparently, she is closed for awhile due to a death in the family according to her FB page. Probably best to call before you plan to visit: 828-289-4429

<https://www.facebook.com/The-Right-Track-Toy-Train-Museum-141291999274246/>

FUTURE PLAN:

**2022** - everything that is for sale in the museum - 20% off. Closed Thurs.

**2023** - everything that is for sale in the - 30% off. Closed Fri.

**2024** - EVERYTHING in the museum 40% off. Closed Sat.

Peggy plans to close the museum at the end of the 2024 season and sell the building