# Sustainable Railroad Solutions — The Right Track to Economic and Environmental Success

By David M. Taylor, CNU

The railroad industry's response to the issues of sustainability and greenhouse gas reductions can be described as both progressive and aggressive. Edward R. Hamberger, President and CEO of the Association of American Railroads, gave recent congressional testimony, saying, "Greater use of rail transportation offers a simple, cost-effective and immediate way to meaningfully reduce greenhouse gas emissions without potentially harming the economy."

Railroads have offered sustainable transportation solutions for a long time, and continued investment by the rail industry only improves its position as this issue races to the forefront of the American conscience.

A common misconception is that the push for sustainability is primarily government-driven. In truth, sustainability is not simply about meeting regulatory requirements or qualifying for environmental permits. It is about striving for the "triple bottom line"—environmental stewardship, community enhancement and economic growth. With the right approach, the triple bottom line presents opportunities to enhance a company's bottom line as well, which is why the thrust for sustainability comes from private industry. Doesn't it make sense that the same GenSet locomotives being deployed to lower the carbon footprint of trains will also help lower operating costs by reducing fuel consumption?

### Sustainable Solutions Defined

*Sustainability is the act of balancing the environmental, community and economic needs of the built and natural environments for present and future generations.*

Whether in the popular press or scholarly research, the issue of sustainability is pervasive. Today, we are faced with such questions as:

- Do we have reliable sources of energy?
- Are there irreversible environmental consequences?
- Do increasing greenhouse gases lead to climate change?
- Can we make our communities more livable?
- Do we offer the full range of mobility choices?
- Can we maintain our quality of life?
- How do we sustain long-term economic growth?
- Are we offering equitable economic opportunity?

The essence of these questions is "Will future generations be able to enjoy the same benefits our current generation enjoys?"

Though there are multiple concerns and questions embodied in the concept of the triple bottom line as it relates to economic growth, balanced sustainable solutions result in sound choices and decisions that:

- Are resource sensitive
- Create quality and diverse places where people can live, grow and flourish
- Provide opportunities for economic growth and development
- Are socially equitable
- Consider the broad context of each decision

### The Rail Advantage

"One way to positively impact the environment is reducing fuel and energy consumption," Hamberger said in his statement to Congress. "Railroads last year were able to move a ton of freight an average of 436 miles on a gallon


Anthony Gruppie

GenSet locomotives are one way the rail industry is staying ahead of the curve on providing sustainable freight transportation.

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Chris Starnes

GenSet locomotives use smaller generator sets that consume less fuel and produce fewer emissions.

of diesel fuel. It's like moving a ton from Boston to Baltimore or Eugene, Ore., to San Francisco on just one gallon of fuel.

"If just 10 percent of the long-haul freight moving by truck were shifted to rail, annual fuel savings would exceed one billion gallons. Freight railroads account for just 0.7 percent of the nation's greenhouse gas emissions."

### Sustainability in Action

So we know rail freight can be a more sustainable solution than over-the-road trucks, but what are railroads doing to further improve their triple bottom line? And equally important, how do those actions improve the business bottom line for railroads?

There are numerous ways railroads can and do incorporate sustainable practices into their operations. The good news is that many major carriers are already doing so.

One of the most obvious places for railroads to begin is with new engine technologies, or so-called "green" trains, and they are applying more sustainable practices and applications daily. Generator set, or GenSet, locomotives replace one high horsepower locomotive unit with two or more lower horsepower, lower emission units. Computer controls determine the horsepower needed during operations and activate the appropriate number of GenSets. These new engines show a 15 to 40 percent improvement in fuel efficiency and produce 80 to 90 percent fewer greenhouse gas emissions.

Future improvements include more advanced hybrid and fuel cell locomotives, including hydrogen cells. Hybrid locomotives use batteries instead of generators to power traction motors. A small diesel engine runs a generator on-demand to keep the batteries charged. Fuel cell locomotives, on the other hand, are powered by alternatives such as hydrogen. Fuel cell technology could eliminate the dependence on oil-based fuels altogether.

To reduce harmful emissions from existing locomotives, oxidation catalyst filters and diesel particulate filters can be installed to convert particulate matter to water and carbon dioxide. Test results have shown a reduction in particulate emissions of 50 to 75 percent.

As technologies evolve, there are other ways to reduce fuel consumption in existing equipment. Union Pacific Railroad, for example, initiated a "Fuel Masters" program to reward locomotive engineers who demonstrate more fuel efficient practices. Monthly totals are calculated and compared, and the top engineers receive fuel cards they can use for their personal vehicles. The program shows an average 5 percent decrease in fuel consumption by participating engineers.


Hybrid locomotives, such as RailPower's Green Goat, use batteries instead of generators to power traction motors. A small diesel engine keeps the batteries charged.

Another way railroads are saving money and cutting waste is by reusing and recycling rail and ties. Whether it is relocating track materials from sections that are no longer in service or selling them to contractors, these efforts are keeping materials out of landfills. In some cases, wood crossties are being replaced with concrete or composite ties, which reduce waste long into the future and save railroads money in maintenance expenses.

Perhaps the most overlooked work being done on the sustainability front is the collaborative efforts between railroads and communities to make infrastructure improvements. Grade-separated crossings make for safer motoring and can improve operational speeds for the railroads. And by eliminating the need for passenger vehicles to sit and idle at crossings, they also reduce greenhouse gas emissions. It is a win-win for communities and railroads.


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The creation of Quiet Zones is another example of railroads and communities working together. Eliminating whistle noise contributes to the environmental component of the triple bottom line by reducing noise pollution—a significant problem in many urban areas.

It isn't just the railroads footing the bill for all of these improvements, either. Programs like CREATE, a public-private partnership between the U.S. Department of Transportation, the State of Illinois, the City of Chicago, Metra, Amtrak and the nation's freight railroads, means the partners share the financial responsibility of rail improvements in urban settings. CREATE will invest in critically needed rail infrastructure improvements to improve quality of life for Chicagoland residents. Likewise, efficiency of freight and passenger rail service is increased throughout the region. Again, this represents a win-win scenario for railroads and communities.

## Conclusion

Is sustainability a good investment for railroads? Absolutely, and the long-term benefits can create significant returns on that investment. More fuel-efficient locomotives provide a return in fuel costs, as do fuel conservation programs. Recycling materials lessens the burden on landfills and saves money on new materials. Quiet Zones foster good relationships with communities and reduce noise impacts from passing trains.

In short, practicing sustainability improves the environmental and cost advantages rail already offers, making railroads an even better value for their customers.

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