



OPINION: Rail Electrification – Has This Train Left the Station?

You can forgive the Rail Electrification Council for being dismayed by the skepticism expressed by the American Association of Railroads about the future of rail electrification. The Council's mission is to partner with railroads and electricity producers in promoting electricity as motive power for transportation and a viable means of transmitting power along with the network of railroad rights-of-way. [\[The Value of Rail Electrification\]](#) Although AAR sees understandable barriers to what the President calls a “rail revolution” propelled by climate concerns and the coming decarbonization of energy and transportation generally, participants in each of these critical infrastructure industries would benefit from some open-minded conversation.

Freight rail companies, especially Class 1s, protect their returns vigilantly and approach new investments with tight-fisted determination and a concern for safety and efficiency. The American Society of Civil Engineers has just given freight rail a “B” rating – higher than almost any other part of American infrastructure – in recognition of its strong record of private reinvestment in its existing network. Yet, the major financial and operational challenges posed by electrification and digitalization, and infrastructure modernization are formidable. So, railroads, like utilities, face new realities and technologies that may erode old assumptions and practices. As Daniel MacGregor recently noted in *Rail Age*, “there is...complexity and co-dependency built into the [rail] system. If there is a risk in missing out on innovation, there is also a perceived risk in driving innovation too fast for adjacent stakeholders to keep up [e.g., with new interchange or feeder services]. That does not, however, reduce the need to change.” It's a balance.

The transformative influences that the Council believes may yet engulf the assumptions of American industry are also like to impact the 160-year old rail transportation system. Those trends are altogether recognizable. Because of that, the Council offers to be a forum within which its natural constituents – railroads, manufacturers, and power companies – can come to terms with how to adapt, strategically and pragmatically, to the changed circumstances being driven by economics, public policy, and advancing technology. We identify some of those drivers here for further consideration:

- American infrastructure is aging, often inadequate, and sometimes dangerously deficient. There is a palpable movement to invest significantly in the electric economy in the next two decades. Job creation and economic revitalization are assured outcomes of such investment.
- Transportation, especially highway vehicles, is predicted to become highly electrified and automated, creating greater competition for rail and potentially unacceptable congestion levels.
- Electrification will accelerate in manufacturing, transportation, heating, and other segments of the economy, necessitating significant demand for investment in the high-

voltage electric grid, energy storage technology (batteries), and advanced fuels like hydrogen.

- Public policy in the state, federal, and international arenas reflect a growing consensus about switching from fossil fuels to renewable resources and a deepening commitment to addressing climate change.
- Electric motors are a more efficient, stronger, and cleaner mode of rail locomotion than diesel engines or diesel-electric motive power, currently dependent on the fossil fuel supply chain.
- Though rail electrification infrastructure (e.g., catenary, large batteries, refitting the thousands of operating engines) would be expensive, electrification – especially using renewable energy sources – would be environmentally beneficial and much less expensive for fuel and maintenance in the long run.
- The growing enthusiasm for a more integrated, even national, high-voltage grid, with its enormous reliability, clean energy, and market benefits, raises significant siting and land use questions that railroads can contribute to solving, with potentially significant returns on their historical patrimony.

The Council has no single theory about how these factors will play out. But it welcomes analysis and discussion about what is possible and in the larger public interest. It believes there is a risk to railroads, the utility industry, the economy, and consumers inherent in missing out on innovation – and this very transformative moment.