

The Future of Transportation: Bridging the Gap to the Electrification of Long-Haul Trucking



Benjamin Jackson
bjackson@mwlaw.com
(501) 688.8887



Devin Bates
dbates@mwlaw.com
(501) 688.8864

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With the specter of increased fuel efficiency laws looming, and feeling the continual pressure to move freight more economically, many in the trucking industry are embracing hybrid engines. But that technology is not ready for adoption en masse, leaving electric trucks in beta mode. However, researchers at the Massachusetts Institute of Technology (MIT) recently announced that they have developed a plug-in hybrid engine system that has the potential to serve as an intermediary technology to help the industry transition big long-haul rigs to electric power.

The Problem. Electric trucks require large batteries, which themselves can take up a substantial amount of the space that could instead be used to haul payloads. Furthermore, the availability of battery recharging stations are limited, and the time that it takes to recharge a large battery can be substantial. Some trucking companies have already adopted electric technology in isolated markets, but the reality is that these problems prevent a large scale roll out.

MIT's New Technology Solution. This new engine is designed to run on gasoline, ethanol, methanol or a blend of these fuels. Compared to traditional diesel engines, the new engine is lighter, cheaper, and better for the environment. This new engine could recharge batteries, and so while batteries are not at the center of this technology, it could be adapted overtime to incorporate a more battery centric propulsion system. The drawback is that maintenance costs are higher.

The Regulatory/Legal Environment. The trucking industry faces ever increasing pressure to increase fuel economy and decrease emissions. This pressure often comes from the federal government, as seen through the EPA's Tier 4 regulations ushering in a significant reduction in the allowable levels of exhaust emissions from diesel engines. States can also heavily regulate trucking through the adoption of strictly enforced rules. This is most notable in California, where soon the DMV will only register vehicles compliant with diesel pollution requirements, and by 2023 almost every truck and bus will be required to have 2010 model year engines or the equivalent. Earlier this year, such drastic approaches spread beyond the borders of California, and other state legislatures have begun considering and approving laws that require truck owners to replace older diesel engines with newer models. In part because of all of this change, some state and federal funding exists for alternative fuel programs. This complex web of federal, state, and sometimes even local laws leaves long-haul truckers with a substantial list of legal compliance concerns.

Bottom Line. This new engine from MIT does not mean the immediate electrification of long-haul trucking, but it does represent an intermediary step that transportation companies can rely upon. Full electrification will come later, quite possibly piggybacking on MIT's new invention. In the meantime, this

engine is a novel development for long-haul trucking, one that offers benefits to not only the environment, but also the bottom line.

Technology Reference: <https://ctl.mit.edu/news/mits-hybrid-engine-could-electrify-long-haul-trucking>