Wired for Sustainability: Innovative Copper Infrastructure Design Solutions to Optimize Copper-Based Systems Without Performance Loss

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I engineered prototypes to show how much copper can be saved by making a simple change with a one-wire system for cars. Copper mining could be reduced in aid of our planet during this ongoing climate crisis if this one-wire system is implemented into vehicles. Copper mining tends to lead to poisoned water sources and also is very toxic to those who mine. Additionally, the one-wire system would be very cost-effective for car manufacturers, which will in turn save consumers money. After designing and building prototypes of the systems, the one-wire system had approximately 80% less copper than the traditional wire harness system. The traditional wire harness system has a wire for each input and output. The one-wire system used chips to simplify the circuit and use one conductor instead of many. After much tweaking, both of the systems worked without any errors. My engineering goal was accomplished and it is supported that the one-wire system can both function and reduce the need for copper.