Efficient Electrical Machines

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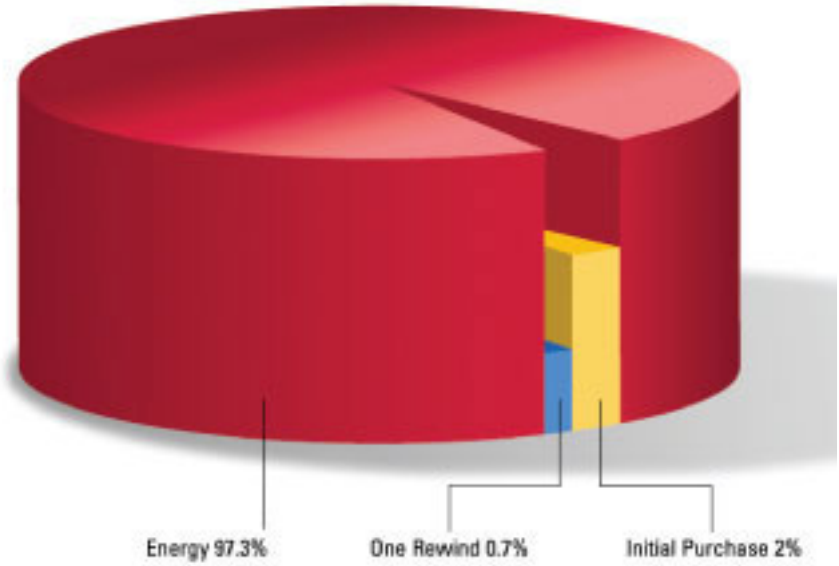

Motors are found in a variety of industrial applications, powering everyday tools such as fans, blowers, and pumps. According to the U.S. Department of Energy, over half of all electrical energy consumed in the United States is used by electric motors. And the National Electrical Manufacturers Association says electric motor systems account for 70 percent of manufacturing electricity consumption, presenting one of the largest opportunities for energy conservations, and efficiency. Therefore, in the face of economic uncertainty and growing sustainability initiatives, motor efficiency and lifetime energy consumption should be a major factor in the decision-making process when making a new purchase versus rewinding a motor.

Energy-efficient motors, which can be two to eight percent more efficient than standard motors, owe their premium performance capabilities to new technologies and design manufacturing improvements. Better electrical steel and more copper in the winding help reduce a motor's energy loss, which requires a smaller fan to dissipate heat. Neodymium magnets, which are used in electric vehicle motors, allow motors to be produced with a higher power density—higher horsepower in a smaller frame. Manufacturing motors with lower-electrical-loss steel and thinner stator laminations can reduce electrical losses. Lengthening the core and using more aerodynamic cooling fans can further reduce energy waste. Energy-efficient motors, though more expensive initially, have longer insulation and bearing lives, less vibration, and increased lifetime reliability.

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