Opinion

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Potential Environmental Problems That Could Stem From Improper Management

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Description

The automobile is undergoing a revolution in the design of its electrical system. This is the result of increasingly sophisticated engine and body controls, as well as the introduction of new, electrically controlled functions. The main electrical bus of the future will be 42 V, and it will be buffered by a 36 V battery. As many devices and electronic control units require voltages different from 42, conversion from the 42 V bus to these other voltages will be necessary. Some anticipated features, such as electromechanical engine valves, will demand both conversion and sophisticated control at power levels in the 2 kW to 10 kW range. These, and other developments in automotive engineering, are promising to create a vital and challenging new market for power electronics in the next decade. Tomorrow's marine electrical systems will be profoundly different from today's systems.

Electric Vehicles

Power electronics is making major impacts on virtually every marine system including propulsion, power distribution, auxiliaries, sonar, and radar. Newly emerging materials, components, and system concepts (such as wide band-gap materials, silicon-carbide-based power semiconductor devices, Power Electronics Building Blocks (PEBBs), and integrated power systems) are, and will continue, enabling future marine systems as different from today's systems as steam ships were to sailing ships. However, these enabling technologies and concepts are not well known and have been difficult to understand. This paper will introduce these new concepts and technologies, identify potential impacts, and explore new design methods to simplify marine electrical system development. In response to concerns about energy cost, energy dependence, and environmental damage, a rekindling of interest in electric vehicles (EVs) has been obvious. Based on the "California rules" on zero emission vehicles in the United States, as well as similar tightened air pollution regulation in Europe, Asia, and much of the rest of the world, the market size of EVs will be enormous. Thus, the development of power electronics technology for EVs will take an accelerated pace to fulfil the market needs. This paper reviews the current status of multidisciplinary technologies in EVs. Various challenges of power electronics technology for EV propulsion, battery charging, and power accessories are explored. The development of new legislation on collection, recycling and disposal of waste electrical and electronic equipment (WEEE) as well as the scaling-up and privatisation of the WEEE processing industry, are indications of major changes for WEEE management in China. However, China's attempts to regulate the industry and establish a financially viable, environmentally benign and safe WEEE management system are facing significant challenges. The existence of an extensive informal sector, combined with a lack of environmental awareness among WEEE collectors, recyclers and consumers, are contributing to China's difficulties in developing a financially and environmentally sound recycling and disposal system. This paper discusses the current status of WEEE recycling and disposal in China, and its impacts on the environment, human health, and the economy. It also examines the legislative and market responses to the WEEE issue, and how these will be affected by Chinese attitudes and practices towards WEEE recycling.

Recycling Industry

The production of electrical and electronic equipment (EEE) is one of the fastest growing global manufacturing activities. This development has resulted in an increase of waste electric and electronic equipment (WEEE). Rapid economic growth, coupled with urbanization and growing demand for consumer goods, has increased both the consumption of EEE and the production of WEEE, which can be a source of hazardous wastes that pose a risk to the environment and to sustainable economic growth. To address potential environmental problems that could stem from improper management of WEEE, many countries and organizations have drafted national legislation to improve the reuse, recycling and other forms of material recovery from WEEE to reduce the amount and types of materials disposed in landfills. Recycling of waste electric and electronic equipment is important not only to reduce the amount of waste requiring treatment, but also to promote the recovery of valuable materials. EEE is diverse and complex with respect to the materials and components used and waste streams from the manufacturing processes. Characterization of these wastes is of paramount importance for developing a cost-effective and environmentally sound recycling system. This paper offers an overview of electrical and e-waste recycling, including a description of how it is generated and classified, strategies and

technologies for recovering materials, and new scientific developments related to these activities. Finally, the e-waste recycling industry in India is also discussed.