advanced battery technologies. This methodology considers both the traditional measures of battery performance (specific energy, costs, and cycle life) and the equally important practical evaluation criteria (probability of technical success, operating and maintenance parameters, and safety/environmental impact). The second objective is the development of procedures for generating battery test programs normalized to specific technologies and electric vehicle mission specifications.

To accomplish these objectives vehicle design and cost models were used to produce optimized vehicle designs and estimates of the total cost of vehicle ownership. Emphasis was placed on subcompact vehicles with ranges between 60 and 160 km. Vehicles with ICE equivalent power capability were of particular interest in the development of market impact estimates. Market impact and potential petroleum savings were estimated by comparison of vehicle ownership costs with equivalently sized petroleum fueled vehicles.

A single figure of merit for each candidate battery system was developed by combining estimates for petroleum savings with a ranking procedure developed to compare each battery's potential for technical success and suitability for EV use with existing lead–acid batteries. The combined figure of merit, reflecting both the technical desirability and the practical suitability of each battery system, provides a concise planning and decision making tool.

While the specific objectives of this program are limited to the development of the evaluation methodology rather than the presentation of actual battery system comparisons, several conclusions were reached as a result of trial runs using available estimates of battery performance:

(1) Battery systems with energy densities as low as 40 W h/kg have large market potential if they can be manufactured at low cost.

(2) High first cost suggests that practical electric vehicles will be limited to urban driving ranges of less than 200 km.

(3) Unless battery costs can be reduced substantially there is little additional incentive for energy densities above 120 W h/kg.

(4) Cost optimized EV's will have ranges in the area of 80 - 120 km.

(5) The comparative utility of batteries is more sensitive to their probability of technical success and practicality for EV use than it is to differences between anticipated energy density and cost levels.

OXYGEN ELECTROCATALYST PREPARATION AND CHARACTERIZATION

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Case Western Reserve University is carrying out Tasks 1 - 4 in close cooperation with the Diamond Shamrock Corporation as the prime contractor.