

Electric Vehicle Revolution II

Overview

This is an updated version of last Fall's course. The electric vehicle landscape is rapidly evolving. There are more affordable EVs available and the charging infrastructure is improving. The course emphasizes battery electric vehicles. Topics include: (1) The environment and EVs, (2) The evolution of modern EVs, (3) Pros and cons of ownership, (4) Incentives and tax breaks, (5) Barriers to adoption, (6) Evaluation of available EVs.

Course Outline

1. Are EVs better for the environment? Are hybrids and plug-in hybrids sufficient?
 - 1.1. The need to stop using fossil fuels for transportation
 - 1.2. Mining lithium and rare earth metals
 - 1.3. Battery manufacturing
 - 1.4. Battery disposal and recycling
 - 1.5. Carbon footprint of electric generation
 - 1.6. Impact on the electric grid and electricity generation
2. The evolution of modern EVs beginning with the 2008 Tesla Roadster
3. Pros and cons
 - 3.1. Purchase prices are decreasing
 - 3.2. Low operating costs
 - 3.3. Low routine maintenance costs
 - 3.4. Range anxiety
 - 3.5. The number of charging stations is increasing
4. Incentives and tax breaks
 - 4.1. Vehicles that might qualify for the full \$7,500 tax credit
 - 4.2. Vehicles that will qualify for the \$3,750 tax credit
 - 4.3. State rebates
 - 4.4. Incentives offered by manufacturers
5. Barriers to wide adoption
 - 5.1. Fear of Li-Ion batteries; safety and replacement cost
 - 5.2. Vehicle fire statistics for hybrids, gas burners and electric cars – you might be surprised
 - 5.3. Crash safety ratings
6. More EV models are becoming available – how do you choose?
 - 6.1. Range
 - 6.2. MPGe and efficiency
 - 6.3. Charging options
 - 6.4. Incentives and tax breaks