

Scenaria,

**Case Study Summaries
Government Agencies**

Situation:

- State-based research center charged with managing investments in medium and heavy-duty vehicle fleet fuel efficiency
- Need to develop a roadmap for planning, demonstrating, and commercializing MD/HD vehicle technology, fuels, and market incentives in order to meet the state's 2020 petroleum reduction goals

Approach:

- Systematically facilitate and catalog evaluation of potential technical and market "pathways" from subject matter experts
- Create and codify a decision-making process to evaluate potential pathways, based on their impact to petroleum/ alt. fuel usage, GHG emissions, and size of investment
- Evaluate sensitivities from market scenarios, and incentives, and potential changes to strategic plans

Results:

- Projected investment of \$435M for MD/HD fleet to meet 2020 petroleum reduction goals in the most cost-effective manner
- Provided feasibility matrix, which evaluated the impact of investments on penetration rates
- Recommendations used to determine the overall impact of "pathways" on emissions from each MD/HD truck category

Situation:

- Government agency responsible for improving military fleet fuel economy at lowest total cost while managing multiple vehicle attributes and requirements across a wide range of operating conditions
 - Operating cycle, delivered fuel cost, and annual miles traveled are estimated but can vary significantly depending on external influences
- Objective was to define the optimal bundle of technologies that consistently deliver the best value given the potential range of influential factors

Approach:

- Develop Fuel Economy / Cost optimization model (fuel economy data came from vehicle simulation conducted by AVL)
- Develop interactive tool enabling user to select fleet usage characteristics, baseline assumptions and uncertainties, and then optimize selected financial parameters.
- Investigate performance of technology kits across vehicle applications and duty cycles
- Demonstrate tool usage in order to define highest value technologies and upgrade kits to consider for fleet installation

Results:

- Analyzed over 200,000 combinations of technology bundles from fuel economy simulation, and highlighted lowest total cost and best ROI technology bundles
- Identified top ten 'kits' based on robustness to changes in duty cycle, fuel cost, and annual miles traveled
- Demonstrated actions needed to achieve of 20% fuel economy improvement for less than \$1500 per vehicle and an annual operating cost saving of over \$1600 per vehicle