

SUSTAINABLE TRANSPORTATION ENERGY PATHWAYS

A Research Summary for Decision Makers

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Part 4: Policy and Sustainable Transportation



We have explored and compared advanced vehicle and fuel pathways and imagined scenarios that might get us to specific targets. Now we must ask, What policy measures and tools are needed to encourage progress toward a sustainable transportation system? What are the measurement challenges that must be addressed in order for analysts to be able to predict the full impact of potential policies? The three chapters in this section address those questions.

- **Chapter 11** argues that in the face of petroleum’s stubborn dominance as a transportation fuel, a new policy instrument known as a low-carbon fuel standard (LCFS) is the most promising approach to getting the carbon out of fuels. This chapter summarizes failed and ineffective approaches of the past and points out the trouble with current mandates and proposals. It then traces the emergence in Europe and the United States of a GHG performance standard for fuels, looks at the details of California’s LCFS, and suggests that these initiatives might lead the way toward a harmonized international effort.
- **Chapter 12** explores four key measurement uncertainties that create challenges in accounting for the climate impacts of biofuels—uncertainties that transportation policies designed to encourage low-carbon fuels must address. First, an accounting of the climate impacts of biofuels should consider the effect over time of GHG emissions from direct land-use change. Second, there is a need to account for non-GHG global warming factors such as albedo, and the effect of non-Kyoto gases and pollutants such as aerosols and black carbon. Third, more

work needs to be done on the question of how to account for GHG emissions due to indirect land-use conversions. And fourth, when forest wastes are used as biofuel feedstock, changes to the GHG dynamics within integrated forest systems need to be considered.

- **Chapter 13** takes a critical look at life-cycle analysis, for more than twenty years the conventional method used to estimate emissions of greenhouse gases (GHGs) from the use of a wide range of transportation fuels and one basis of our comparisons of vehicle/fuel pathways in this book. As commonly employed, LCA cannot accurately represent the impacts of complex systems, such as those involved in making and using biofuels for transportation. In order to better represent the impacts of complex systems, this chapter proposes a different tool, one that has the central features of LCA but not the limitations—a tool that starts with the specification of a policy or action and ends with the impacts on environmental systems.