SUSTAINABLE TRANSPORTATION ENERGY PATHWAYS

A Research Summary for Decision Makers

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Part 3: Scenarios for a Low-Carbon Transportation Future

Thus far we have explored and compared the alternative fuel and advanced vehicle pathways that might lead us to a low-carbon transportation future. Now it's time to imagine how those different pathways might be combined to reach specific targets. How will our current transportation system need to change if it's to meet ambitious greenhouse gas reduction targets? How will the transition to a low-carbon transportation system occur, and what will it cost? What part will a low-carbon transportation system play in meeting broader economy-wide carbon reduction goals? The three chapters in this section address those questions.

- **Chapter 8** explores how deep GHG reduction targets (50 to 80 percent) could be met in the transportation sector by 2050, with a focus on California and the United States as a whole. It presents a framework for understanding emission reductions in the transportation sector, lays out the major mitigation options for reducing emissions, and presents scenarios to explore how deep reductions could be achieved. It also looks at potential pathways from the present to the deep-reduction scenarios we need to arrive at by 2050.

- **Chapter 9** analyzes and compares alternative scenarios for adoption of new light-duty vehicle and fuel technologies that could enable deep cuts in gasoline consumption and GHG emissions by 2050. It uses simplified technology learning curve models to estimate the transitional costs for making new vehicle and fuel technologies economically competitive with gasoline vehicles.

- **Chapter 10** considers the role the transportation sector might play under economy-wide CO_2 constraints in the United States. If we see emission reductions achieved in different sectors of the economy—including commercial and residential buildings, industry, agriculture, and electric power, as well as transportation—as wedges that add up to an emission reduction target mandated by policy, how might the transportation wedge be optimized at least cost? To address this question, the authors use an integrated energy-economics model called the MARKet ALlocation (MARKAL) model to examine cost-effective deep emission reductions economy-wide and in the transportation sector.