We examine two dimensions of firms’ technology strategy as they respond to the shock of a sharp increase in the price of a key input: the quantum and direction of their research efforts. Directionally, firms can respond to this shock with paradigm-deepening investments that improve the utilization efficiency of the existing input, or paradigm-changing investments that develop technologies to use substitute inputs. We develop a framework that suggests that firms alter their quantum and direction of research based on their level and kind—related vs. unrelated—of diversification. We test our hypotheses examining the responses of large manufacturing firms in the United States to the oil shock of the early 1980s. We predict and find that increasing levels of related diversification led firms to increase their technological efforts in response to the oil-shock, but increasing levels of unrelated diversification led to reduction in technological efforts. As predicted, related diversifiers were significantly more likely to invest in paradigm-changing technologies than unrelated diversifiers. We predict that unrelated diversifiers are likely to exert greater efforts in paradigm-deepening technologies than related diversifiers. We identify the implications of these findings for technological evolution and diversification literatures.