

Preface

When I was in elementary school in the 1960s, my younger brother and I spent our summers with our grandparents in our ancestral village. Coming from the city life of Mumbai, with electricity, piped running water, and cooking gas delivered reliably to my parents' apartment, the village was truly a different world. Summertime on the Indian coast is very hot and humid. The rhythm of life was very different from that in Mumbai. In the village, children and adults would hike a kilometer up a hill each day to fetch drinking water. My grandmother would cook all our meals with fuel wood in the mysteriously dark smoky kitchen. At night, the house remained mostly dark despite a small kerosene lantern that was lit for only a couple of hours after sunset. Every few days, my grandmother would grind grain by hand on a heavy stone wheel to make flour for chapatis. There were no phones, television, or radio at that time. Change came slowly over the decades: electricity arrived, real incomes grew, kerosene (and eventually bottled gas) for cooking became affordable, piped water started getting delivered to the households, and modest amenities such as electric fans, fluorescent lights, and radios eventually became routine in the households.

For the past thirty-five years, I have experienced two worlds almost concurrently: the challenges of the developing world and the amenities of life in the industrial north. As researcher at Berkeley, my work on energy efficiency, safe drinking water, and clean cooking often takes me to poor parts of the developing world. These exposures remind me of my own memories of how it feels to live in the dark after sunset. Such memories have informed my approach to solving problems faced by the poorest billions of people on the planet.

Energy access is essential for achieving an acceptable standard of living. The outstanding papers in this book underscore the following three lessons from my own experience:

1. As Peter Drucker remarked, "Ideas do not move mountains—bulldozers move mountains. The ideas show where the bulldozers go to work." Without the mobilization of a great deal of social forces, mountains cannot be moved, and that entails a lot of sweat and dirt, and long, hard, and unglamorous work.

2. It is not just about technology—many complex social interactions with institutions, stated and unstated rules and customs, and social and personal habits and preferences must be taken into account for successful adaption on scale.
3. Imagining that a novel technological gadget alone will solve a problem is short-sighted. It is like suggesting that distributing pencils and paper will make illiterate communities literate. Technology does not operate in a vacuum. It needs trained operators and trainers for the operators. It also needs supply chains of spare parts, skilled maintenance personnel, and a business model that makes each participating stakeholder a winner in some way. For a technology to make a positive impact on scale, we need to think through how we will build capacity and linkages, and provide incentives to all relevant stakeholders. Their success will lead to end users' success.

I wish the reader success in incorporating ideas from this book in their own work.

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