

# Preface

We all know that the fossil fuels that sustain modern human civilization are finite and polluting. We also know that the amount of sunshine that enters the Earth surface is immense, many orders of magnitude greater than human needs. These two facts lead to one obvious conclusion: we need to replace fossil fuels with solar energy. There are many solar advocates who see the issue as essentially a “no brainer.”

But others understand that solar is far from cheap in monetary terms. The first author, with a great deal of experience in the solar industry, understands this especially well, as he had to sign every purchase order as chief engineer for a series of major solar installations in Spain. In this book, we find that the best way to understand the fossil fuel subsidies that underlie whatever we do in our economy is to “follow the money.” Anywhere in society that money is spent, energy (and mostly this means fossil fuels today) must be used to generate the goods and services that the money represents. In general, we consider money to be a “lien on energy” where general economic agreements allow the bearer of money to purchase energy-requiring goods and services. Manufacturers will purchase and use energy to put goods and services on the shelf in anticipation of sales. Take out the money, and an economy is still possible through barter. Take out the energy, and the economy stops, as the Cubans found in 1988 when the Russians cut off their oil and food disappeared from the stores within a week.

In this book, we attempt to evaluate all (or as many inputs as is possible) of the energy that goes into providing electricity for real-life photovoltaic systems in Spain, the country with the second largest installations of solar power as of 2008. Many of the inputs that we include are normally skipped in typical life cycle analyses (LCE) and energy payback time (EPBT) studies that have been made of solar PV power. While we believe this larger view of inputs to make PV is essential for a comprehensive energy analysis, we recognize that some of our inputs will be controversial. We leave it to the reader and to future analysts to make their own decisions about inclusivity and methods in general for a comprehensive analysis of EROI. Whatever your opinion, this study should really open your eyes to the degree to which fossil fuels underlie everything we do in our technological society.

A series of excellent photographs that help one to get a feel for photovoltaic power in Spain can be found at <http://www.flickr.com/photos/87892847@N03/>

Spain's Photovoltaic Revolution

The Energy Return on Investment

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