# Variable Renewable Energy Grid Integration Studies: A Guidebook

## Draft Outline

**Source**: [Variable Renewable Energy Grid Integration Studies: A Guidebook for Practitioners](https://www.nrel.gov/docs/fy20osti/72143.pdf)

1. **Home**
	1. Introduction to Variable Renewable Energy
	2. How to Use This Guidebook
	3. [Links to Decision Guide]
2. **What is a Grid Integration Study?**
	1. When to Conduct a Grid Integration Study
	2. Questions a Grid Integration Study Can Help Address (*Appendix B*)
	3. Types of Grid Integration Analyses
		1. Capacity Expansion Analysis
		2. Production Cost Analysis
		3. Power Flow Analysis
		4. Relationships Among Different Analyses
	4. Building Blocks of a Grid Integration Study (*Figure 2*)
3. **Stakeholder Engagement**
	1. Mechanisms for Engaging Stakeholders
	2. Actions for the Study Leadership Team (*Box 2, Appendix C, Appendix D*)
		1. What to Consider
		2. How to Decide/ Recommended Course of Action
	3. Additional Resources (*Box 3*)
4. **Data Collection**
	1. Data Needs for Capacity Expansion, Production Cost, and Power Flow Analyses (*Table 2*)
	2. The Importance of High-Quality RE Resource Data
	3. Example Wind and Solar Datasets Used in Grid Integration Studies (*Box 4*)
	4. Data Requirements for Productions Cost Modeling (*Appendix E*)
	5. Actions for the Study Leadership Team (*Box 5*)
		1. What to Consider
		2. How to Decide/ Recommended Course of Action
	6. Additional Resources (*Box 6*)
5. **Scenario Development**
	1. Defining a BAU Scenario
	2. Defining High-RE Scenarios
	3. Defining Sensitivity Analysis
	4. Example Scenarios from Grid Integration Studies (*Box 7*)
	5. Actions for the Study Leadership Team (*Box 8*)
		1. What to Consider
		2. How to Decide/ Recommended Course of Action
	6. Additional Resources (*Box 9*)
6. **Power System Modeling**
	1. Choice of Model
	2. Related Analyses
	3. Actions for the Study Leadership Team (*Box 10*)
		1. What to Consider
		2. How to Decide/ Recommended Course of Action
	4. Additional Resources (*Box 11*)
7. **Analysis and Reporting**
	1. Analysis of Results
	2. Reporting Results (*Appendix F*)
	3. Case Study Spotlight: Figure for India’s Grid Integration Study (*Figure 3*)
	4. The Challenge of Defining and Assessing Integration Costs (*Box 12*)
	5. Actions for the Study Leadership Team (*Box 13*)
		1. What to Consider
		2. How to Decide/ Recommended Course of Action
	6. Additional Resources (*Box 14*)
8. **From Study to Roadmap Creation**
	1. Summary for Decision-Maker
	2. Cost of Conducting a Grid Integration Study (*Table 3*)
	3. Using the Results of a Grid Integration Study
	4. Examples of Grid Integration Studies (*Appendix A*)

