# 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*)

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