

RESOURCE PLANNING FOR ELECTRIC POWER SYSTEMS



KEY INSIGHTS

- Models assume deployment starts in a given year, but real-world delivery requires sequential steps for design, permitting, procurement, and other tasks that span years. Planning that reflects these realities is what ultimately enables infrastructure to be built.
- Project timelines, which can range from 2-3 years (e.g., battery energy storage) to over 10 years (e.g., large light water reactor), are dynamic, shaped by permitting, supply chains, technology novelty, and evolving market conditions.
- Emerging technologies may need new infrastructure, like transmission, CO₂ pipelines, or hydrogen networks, adding regulatory and technical challenges that complicate planning.

Delivering the Energy Transition: Project Timelines & Considerations

by Todd Gorgian



Research Overview

Most large-scale, new generation projects emerge from long-range resource planning, where electric companies and stakeholders define needs and select technologies. Beyond commercial viability, companies must also navigate regulatory frameworks, supply chains, site development, and other challenges that shape how projects advance from concept to operation.

Recent EPRI research synthesizes literature-based estimates and expert judgment to develop notional lead times and delivery pathways for more than 20 technologies in power generation, energy storage, grid support, and enabling infrastructure. It primarily reflects U.S. experience and a range of project scopes. The timelines are instructive, not prescriptive, with cross-cutting factors, such as regulatory complexity, supply chain maturity, and site readiness, highlighted to frame common risks and challenges.

These insights serve as a reference to support planning in an increasingly complex landscape, essential for ensuring reliability and affordability while advancing corporate objectives and broader goals.

Figures 1 and 2 present sample results: Figure 1 shows a generalized project delivery process, while Figure 2 illustrates technology-specific timelines and other key considerations for solar PV.

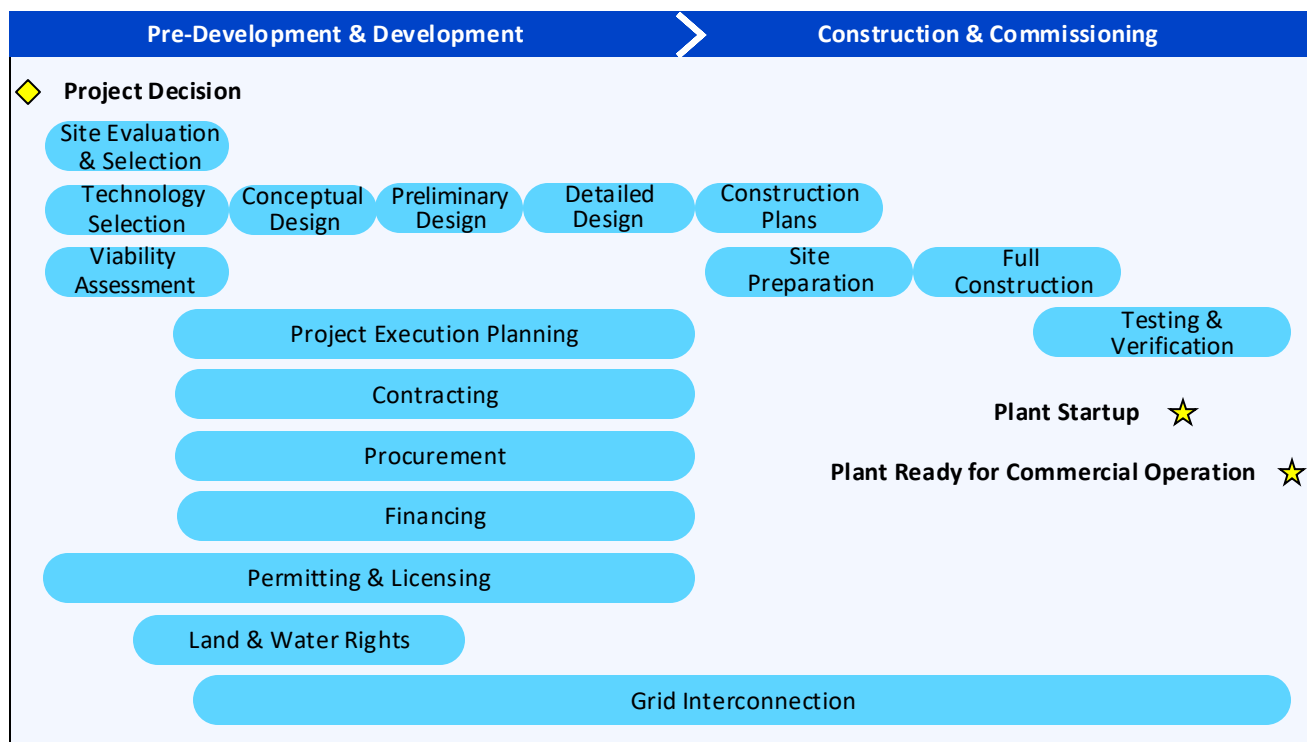


Figure 1: Generalized Project Delivery Process

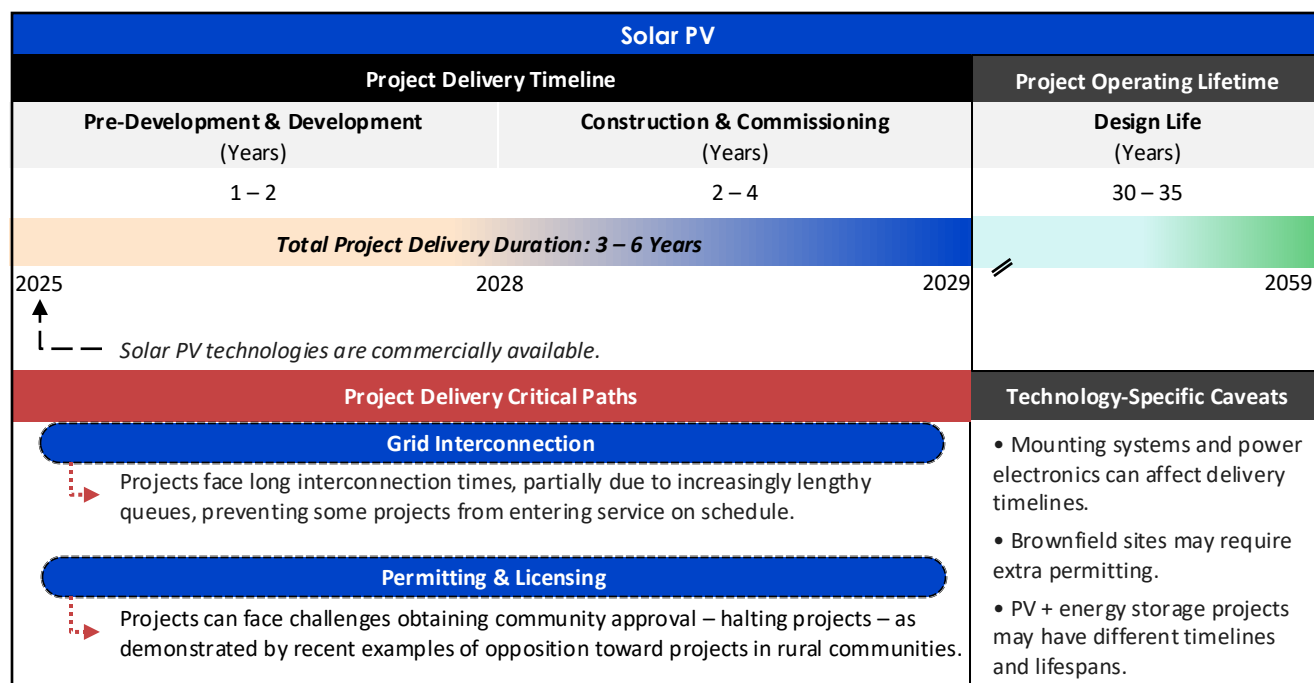


Figure 2: Example: Solar PV Overview

This brief is based on EPRI Report “Charting the Course: Practical Considerations and Project Delivery Timelines for Energy Technologies”

Product ID 3002033848.

RESEARCH CONTACT

Todd Gorgian
tgorgian@epri.com

FOR MORE INFORMATION

Explore EPRI's
 Energy Systems and Climate Analysis Research at
esca.epri.com