

Charting a Course to Energy Independence

Providence, RI
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Renewable Energy Project Finance: Power Purchase Agreements





Overview

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The role of PPAs in Project Finance
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Business Considerations
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Introduction: The Role of PPAs in Renewable Energy Project Finance



What is project finance?

Project finance is limited recourse or non-recourse financing based on the merits of a project rather than the general corporate credit of the project sponsors.





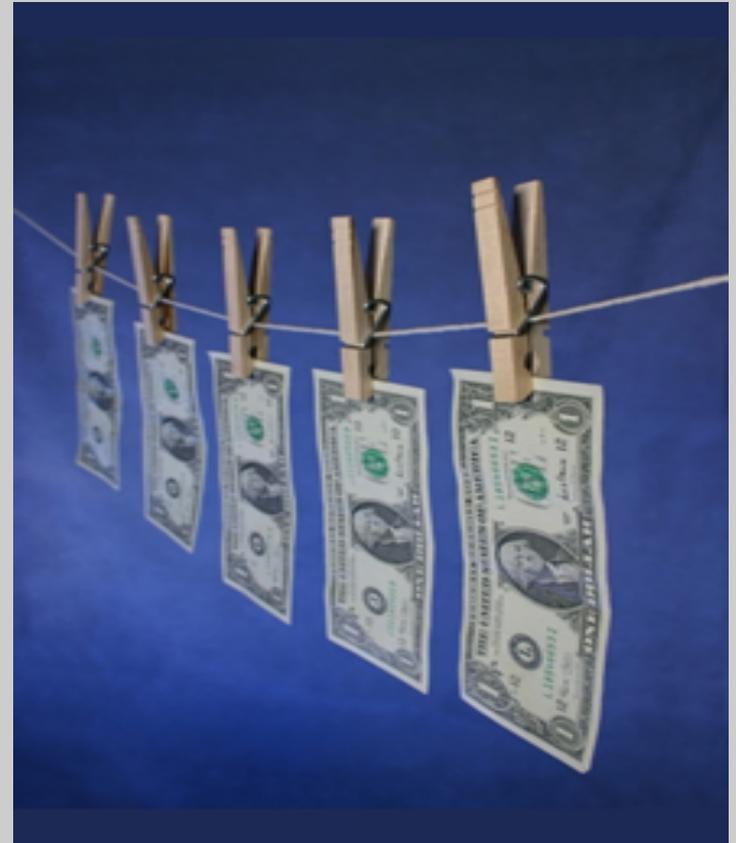
What does that mean?

- Lenders and other funding sources look to a particular project and the money (cash flow) it will generate.
- This is different from general corporate finance where the borrower is an existing company with a balance sheet.
- A strong power purchase agreement is the most direct way to enhance a project's creditworthiness.



What are creditors worried about...?

- Being repaid
- Managing the risk of not being repaid
- Getting credit committees or other stakeholders to approve the transaction by identifying and managing the risks of not being repaid





Risk Identification and Management

- Lenders typically divide project risks in two phases:
 - Pre-completion
 - (includes cost overruns, delays, performance risk, permitting issues)
 - Post-completion
 - (includes operating risk, input/supply risk, compliance risk)



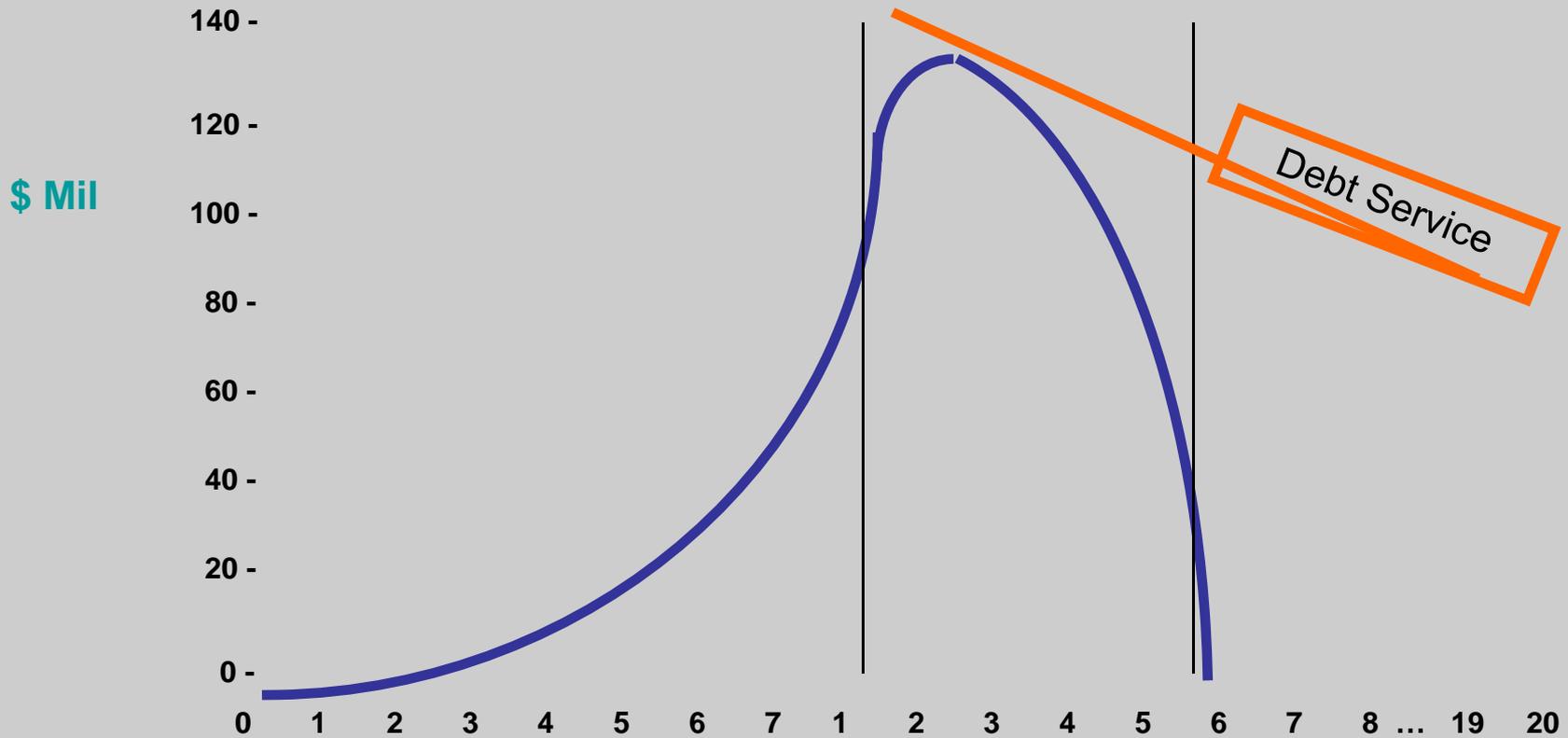


Risk Identification - Periods

Construction/Development

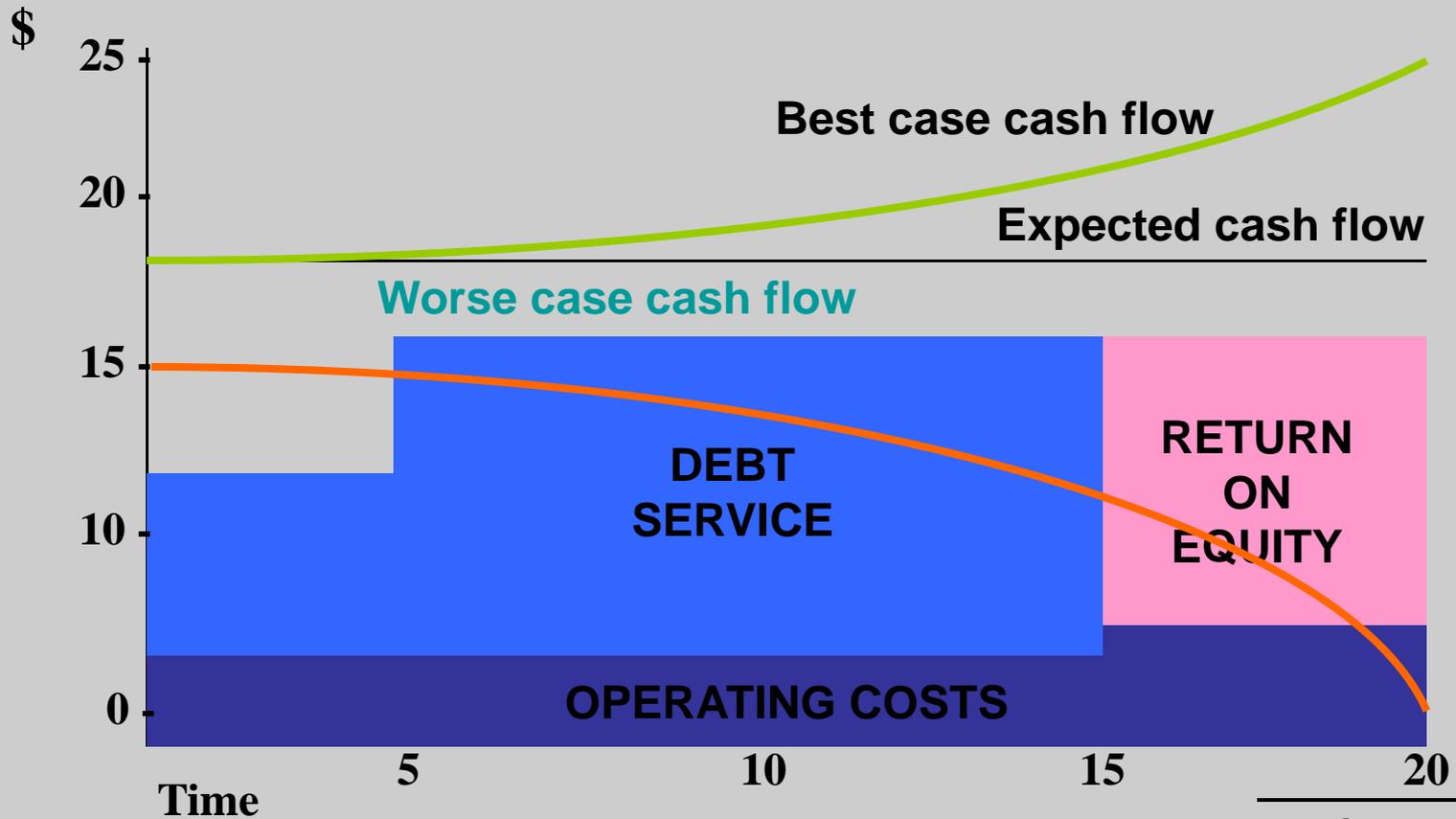
Start-up

Operating





Cash Flow





Key Project Documents

- The key project documents are analyzed to identify risks and, if well-designed, can manage those risks.
- Power Purchase Agreement
 - Commitment of power purchaser to purchase power and of project company to sell power
 - Specified range of power output
 - Designated period of time, including start date
 - Agreed tariff structure, may include:
 - Capacity (fixed) tariff
 - Energy dispatch (variable) tariff



Other Key Project Documents

- Construction Contract (EPC)
- Input Agreements (e.g., landfill gas purchase)
- Real estate matters (e.g., leases)
- Operating and Maintenance (O&M) Agreement
- JV or shareholder agreements





Key Financing Documents

- Loan agreement
- Security documents
- Consents to the grant of security (e.g., assignment of the PPA)
- Possibly: Sponsor support agreements or other forms of credit enhancement





Types of Credit Enhancement

- Solid offtake arrangements (PPA)
- Sponsor support arrangements
- Third party guarantees, letters of credit, etc.
- Insurance

Overall Theme: The PPA is the key to putting it all together, providing the cash flows and managing the risks.



Energy Service Provider Perspective

Crafting a Good Deal: Business Considerations



Power Purchase Agreement (PPA) Business Considerations

- The PPA is the cornerstone financing instrument for utility scale energy projects
- PPAs encompass system design, financing and purchasing
- Allows stable delivery of energy - with no upfront customer costs
 - System owner assumes the risk and responsibility of ownership
 - No customer capital investment – system owner “owns”, operates and installs equipment
 - Cost controls - locks in fixed long-term customer energy rates; includes negotiated escalation rate; typically between 10 and 20 year terms
 - System owner accomplishes system certifications and regulatory requirements





PPA Business Considerations (continued)

- System monitoring, service and maintenance
 - System owner monitors energy production and system health
 - No customer maintenance cost – owner maintains the equipment
- System owner optimizes tax incentives and tariffs
- PPAs place a heavy emphasis on maximum energy production and delivery
- Renewable Energy Certificates (RECs) – PPA addressed
- System can be purchase when the contract term ends - Part of the end-of-term options
- Minor issues can turn to bigger challenges – if not anticipated
 - i.e., insurance, property & sales tax, zoning and roof repair etc.



Summary - PPA Characteristics

- Provides predetermined energy rates for term of contract, typically between 10 to 20 years
- PPA fixed energy rates are a hedge against rising energy costs
- System owner take responsibility for operation and maintenance of energy equipment
- Demands no upfront customer expense in order to purchase energy project
- PPA offer production monitoring and metering by energy experts
- Supports renewable energy industry and local jobs
- Places emphasis on ensuring maximum productivity of the specified energy
- PPA addresses default, remedies and end-of-term options and responsibilities
- Option to purchase the system at fair market value after set time period



Summary - PPA Business Goals

- Minimize owner/customer risk and meets goals
- System operator achieves a reasonable profit and third party investors achieve a reasonable return on investment
- Implementing PPAs should be an upfront, straightforward and as uncomplicated as reasonably prudent
- Fully leverage tax incentives, grant programs, depreciation and RECs to reduce the overall cost of the project
- Owner responsible for environmental, permitting tariffs and certifications
- Establish/maintain significant collaborative relationship with local utility and other project stakeholders
- Clear communication and careful planning are the pillars for a successful PPA energy project



Making it Work: Implementation Challenges



Challenges with PV PPAs

- Design Challenges
- Implementation Challenges
- Business Transaction Challenges
- Ongoing Service and Performance



Design Challenges

- Space
 - Ground Mount vs. roof or car port
- Net Metering?
 - Size system appropriately.
- Maximizing Production
 - Thin Film vs Crystalline
 - Tracking vs fixed
 - Ballasted vs structurally affixed systems
- Structural Integrity





Design Challenges

- System Cleaning:
 - Access
 - Water
- Understanding Building Demand
 - Align PV output with facility demand
- Future Expansion and Impact on System
- Roof considerations
 - Roof maintenance/replacement after PV install
- Shading



Implementation Challenges

- Panel Procurement
 - 25 year warranty against degradation
- Inverter Procurement
 - Extended Warranties- why?
- Interconnect Approvals
- Solar Lease Agreement
 - Site Access
 - System Security
 - Roof tops- Most Secure
 - Car ports- Easy access by the public
 - Ground mount- Need fencing



Business Transaction Challenges

- Payback on Photovoltaic
 - Not attractive when compared to traditional ECMs
- Changing Technologies
 - Fair Market Value at end of term?
- Insurance for System
- Timing and Conditions of Utility Incentives
- State Tax Benefits vs. Federal Tax Benefits
- PPA Variables:
 - REC pricing
 - REC Escalation
 - PPA escalation rate



Ongoing Service and Performance

- Cost to Service and Maintain
- Life Expectancy of the System and Components
 - What is the Total Cost of Ownership
- Temperature Fluctuations
- Severe Weather
 - Water is single largest problem
 - Oxidation and Corrosion



Case Study: Fort Carson, Colorado Solar Project



PPA at Fort Carson, Colorado

- Power Purchase Agreements (PPA) are term contracts to purchase electricity from a particular company and in this case a particular source. I will go through the details so we can learn how to do it.





PPA at Fort Carson, Colorado

Project Details

- \$13 million 2 Megawatt (MW) array will generate approximately 3,200 MWh/year
- Largest array in the Army to date
- Array is ground-mounted, fixed-tilt covering about 12 acres, 6.5 of which overly the former landfill
- First Solar thin film PV technology (9.5% efficiency)
- Fixed, non-escalating energy rate for 18 years
- Western Area Power Administration is contracting agent



PPA at Fort Carson, Colorado

Step One: Vision and Leadership Support





Step Two: Assess the Energy Opportunity Economic, Energy & Environmental Security

- Project Cost = Funding + Financing + Incentives
- Technically Viable
- LCC, Payback, ROI, Reduce Fossil Fuel Pricing Risks
- Economic development
- Market transformation and technology evolution
- Lead by example/demonstrate environmental stewardship
- Reduce air emissions
- Peak energy supply, distributed generation benefits, demand reduction.
- Save water
- Improve Quality of Life



Step Three: Assess and Select Finance Tool

Energy Project Finance Tools

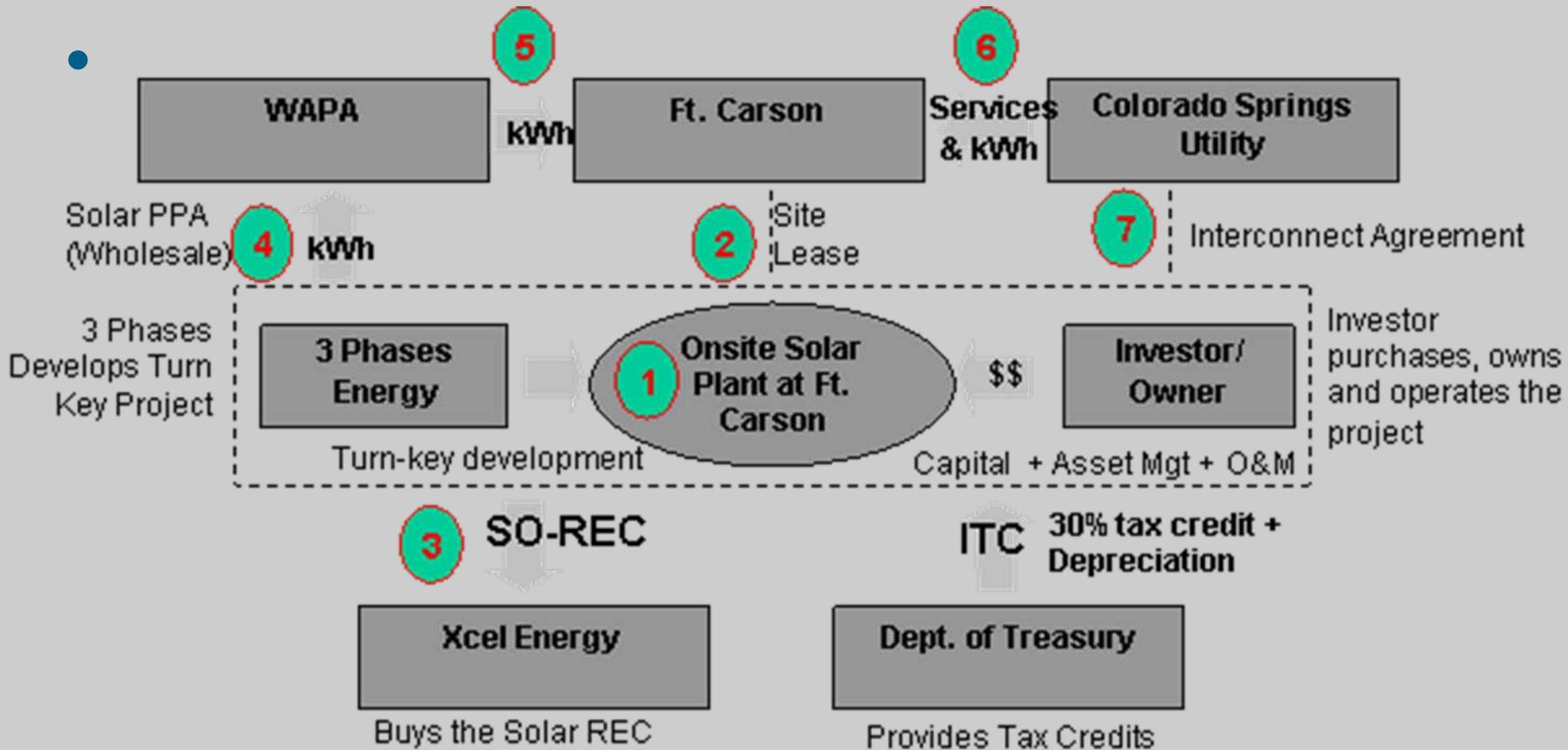
- Direct Budget Funding
- Construction Funding
- Special Program Funding
- Service Contract
- Loan
- EUL vs Lease
- Energy Savings Performance Contract
- Utility Energy Savings Contract
- Power Purchase Agreement...

Assess Finance Tools

- Available Funding
- Available Financing
- Risk
- Capability
- Flexibility
- Experience, Ease of Use
- Cost
- Available Incentives
- Timeliness
- Tool Available, Authorized, or Mandated...



Carson Solar 1, LLC Who and How?





Site Selection Criteria

- Impact upon training
- Available space
- Potential interference with future expansion
- Proximity to suitable electrical transmission
- Slope and grade
- Minimal environmental disturbance
- Proximity to dust/flooding events
- View from housing
- Visible to visitors/passersby



Landfill Cover





Step Four: Marketing Your Team and Project

- Lower Risk
- Long Term Contracts and Leases
- Technically and Economically Viable
- Flexible
- Experienced
- Leadership Support
- Strong and Committed Project Team
- No Cost Land Lease
- Transmission, Solar Resource, Wind Resource
- Economies of Scale



Step Five: Celebrate, Share, and Learn

**Contractor Owned & Operated
Vehicle E-85 Fuel Facility**



Wind Data Gathering



Transpired Solar Collector





Final Review

How to get your project financed?

- Step 1) Vision and Leadership Support
- Step 2) Assess the Energy Opportunity
- Step 3) Assess and Select Finance Tool(s)
- Step 4) Market and Sell Your Project
- Step 5) Celebrate, Share, and Learn



Questions?

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Question and Answers





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