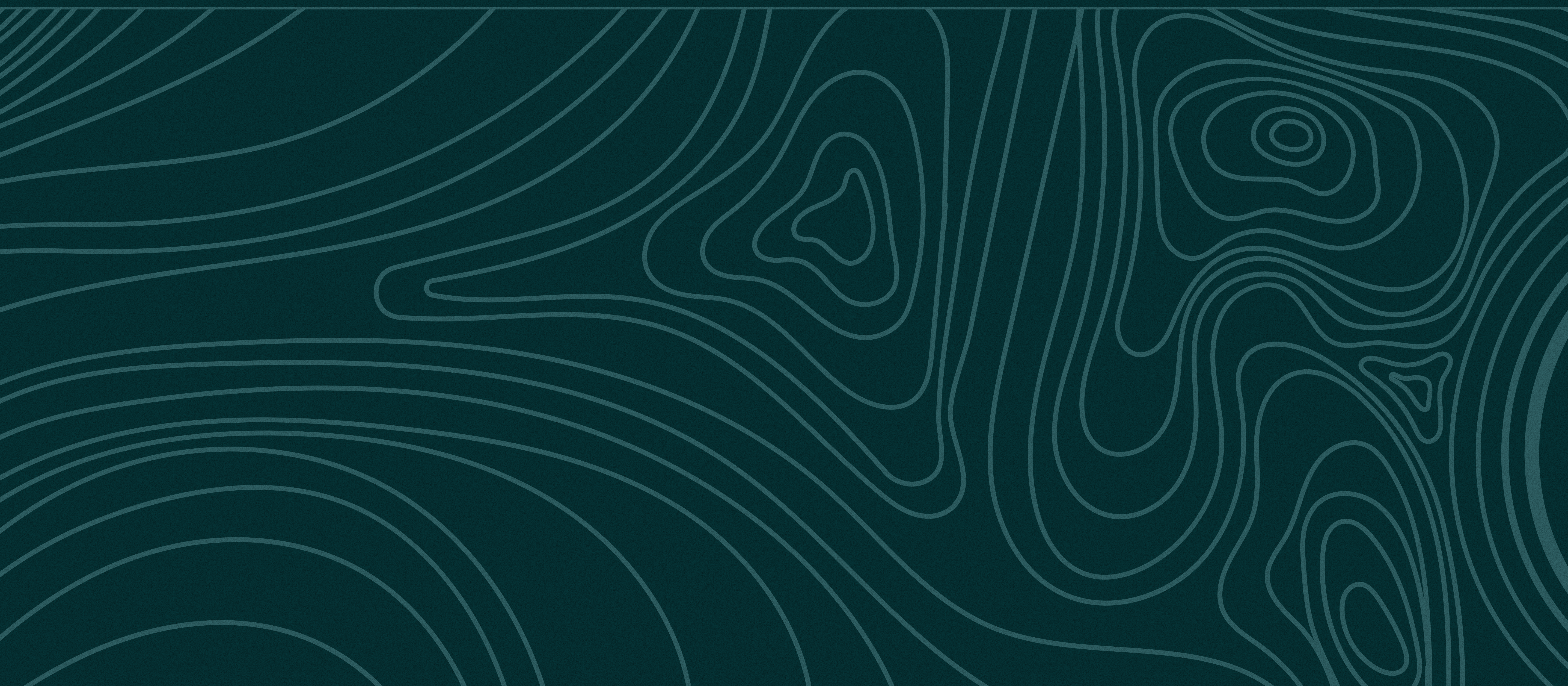




Top environmental risks solar developers encounter

+20 hacks for finding viable solar sites



Content

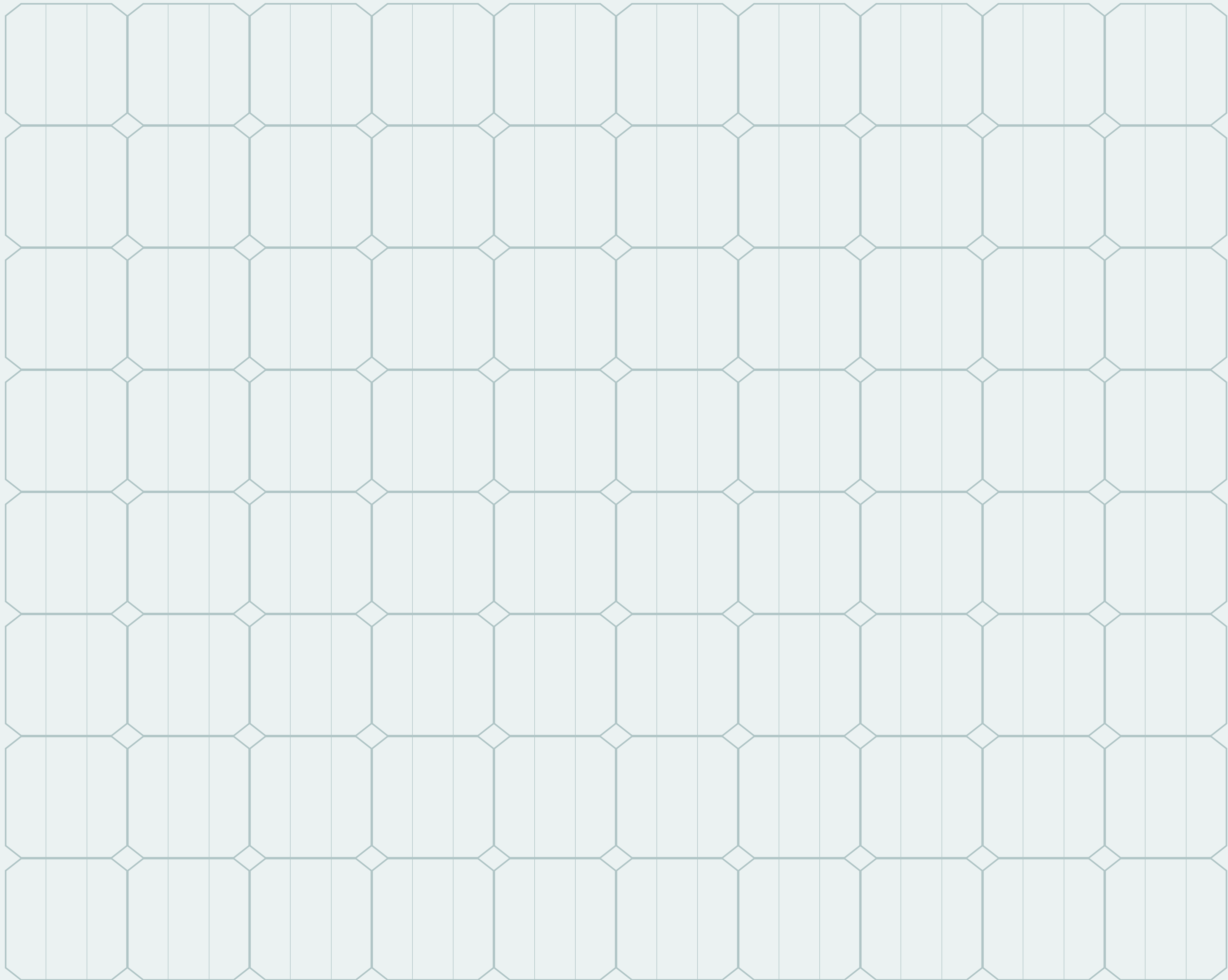
- 01. Top environmental risks solar developers encounter
- 02. 20 hacks for finding viable solar
- 03. Checklist for identifying the best solar sites
- 04. Discover and assess project sites in minutes



Solar power has emerged as a leading force in the renewable energy sector. The utility-scale solar market in North America is experiencing significant growth and technological advancements, leading to cost reductions and improved performance. The market is expanding geographically, and the integration of battery storage is enhancing the value of solar projects.

However, this rapid expansion comes with unique challenges and risks that developers must carefully navigate to ensure the success and viability of their projects. This ebook will share the most significant risks solar developers face, providing a comprehensive guide to understanding, mitigating, and overcoming these obstacles.

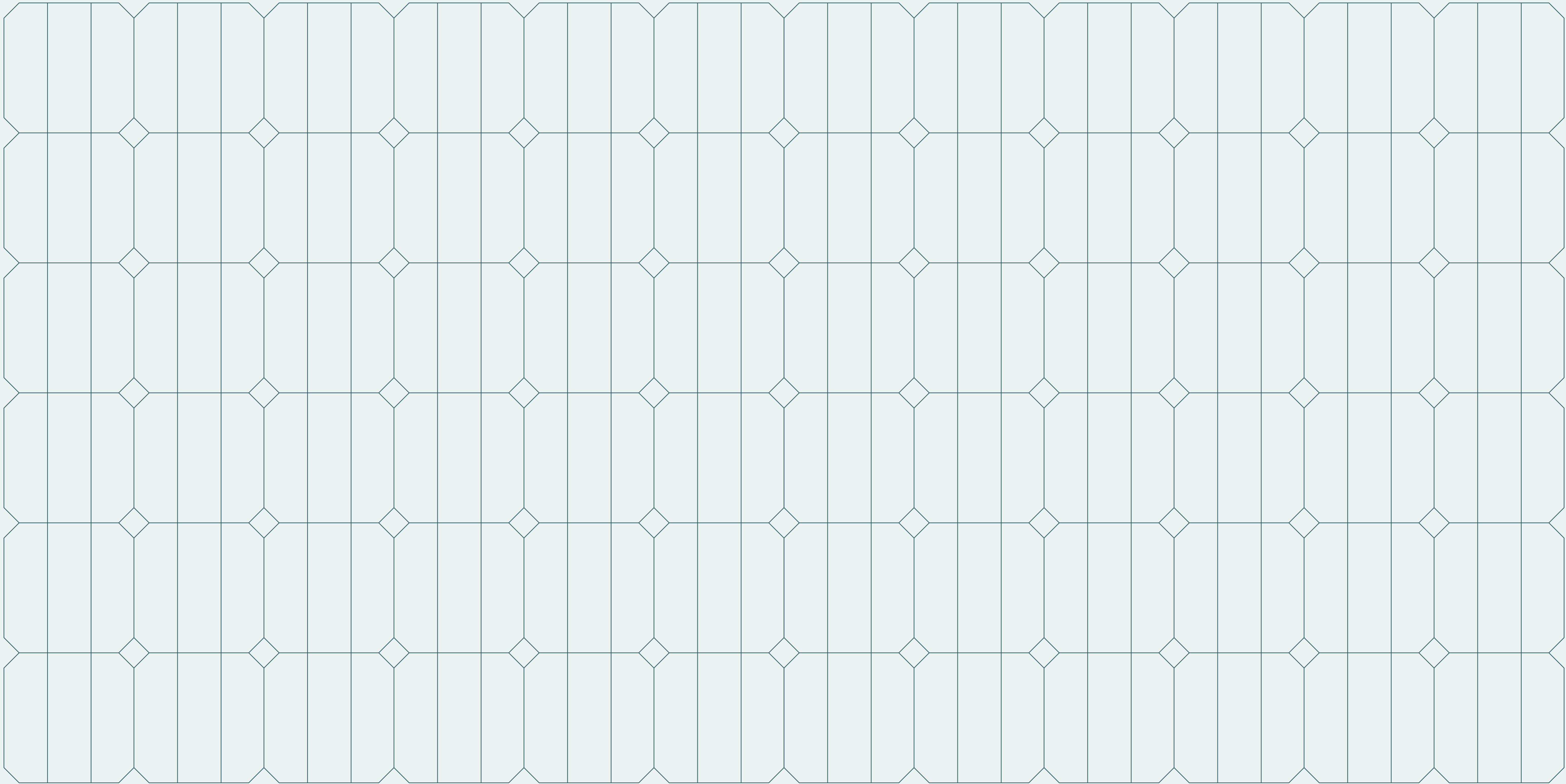
Join us as we uncover the complexities of solar development, offering insights and solutions to help you make informed decisions and build resilient, successful projects.



To learn more about how Transect can help de-risk your solar development projects, [book a demo with Transect today!](#)

01. The top environmental risks solar developers encounter





Community sentiment

While solar power is generally supported for its environmental benefits, enthusiasm can decline when installations disrupt local scenery. Many people favor renewable energy until it affects their immediate surroundings. Large-scale solar projects often face opposition due to concerns about visual impact and the involvement of non-local financiers. Residents' attachment to their environment and desire for fair processes are crucial factors in this opposition. Support and opposition can vary based on demographics and psychology, with proximity influencing attitudes due to concerns about property values and visual impact.

Interconnection delays and unknown power needs

Even a prime solar site can become problematic due to interconnection delays. Over 2.2 TW of capacity is currently stuck in interconnection queues awaiting studies that can take years to complete, with renewables accounting for over 94% of this queue (S&P Global Market Intelligence, 2023). Understanding regional power needs and grid accessibility is essential before committing to a project. The project can become unviable if the power cannot be efficiently transmitted to a grid that needs it.

Upgrade costs

Developers can be blindsided when they do not thoroughly understand the land’s suitability and potential upgrade costs. Based on the System Impact Study (SIS) findings, the Transmission System Operator (TSO) may determine that upgrades to the transmission infrastructure are necessary to accommodate the new interconnection. These upgrades could involve reinforcing existing lines, adding new transmission capacity, or installing additional equipment such as transformers or capacitors. Typically, the developer requesting the interconnection bears the cost of these upgrades, which can significantly increase the project's overall cost, impacting its economic viability and potentially leading to project cancellation. Submitting a permit for interconnection in an area with constrained transmission capacity is complex and costly, posing significant financial risks.





Less greenfields means more complex sites

The reduction in easily accessible greenfield sites has resulted in the need to consider more environmentally complex properties. This does not imply that these sites are unsuitable for solar production but means that due diligence reports will encompass a broader range of factors. The increased complexity in due diligence does not inherently translate to higher costs or a lower success rate for solar projects.

Reduced developable area

Easements, rights-of-way, wetlands, and buffer zones can significantly reduce a site's usable area. Focusing on the total area rather than the net developable area can cause developers to overestimate a project's potential. It is important to conduct thorough land surveys and consider all legal and environmental constraints that might limit the buildable area.

Environmental regulations and species listings

Changes in environmental regulations or the sudden listing of new endangered species can significantly disrupt a project. Failing to stay updated on the latest regulations and conduct thorough checks for endangered species early in development can lead to legal complications and potential project halts.

Business model challenges

Solar power is a competitive and heavily regulated industry. A resilient business model is crucial to navigating these challenges. Competition, regulatory changes, and technological advancements can impact your business. A slow siting process and lack of preparation for potential delays and opposition can mitigate risks and enhance your chances of success.

Federal land regulations

Federal lands offer opportunities for solar development, but they come with stringent regulations and potential cost-recovery fees. The Bureau of Land Management (BLM) offers many suitable tracts, but government land is subject to rules not faced on private property. Building on federal land requires navigating a range of permits and regulatory processes to ensure compliance with environmental, cultural, and land use laws.

Environmental due diligence missteps

Environmental due diligence missteps in renewable development projects can lead to significant risks, including regulatory non-compliance, project delays, and increased costs due to unforeseen environmental assessments and mitigation measures. These missteps can also result in legal challenges, financial losses, and damage to the project's reputation. Additionally, inadequate due diligence may harm local communities and ecosystems, leading to public opposition and conflict with stakeholders, further complicating project implementation and reducing investor confidence.



Local regulatory changes

Local regulatory changes can unexpectedly impact your project. Governments often do not notify developers of regulatory changes, posing significant risks to renewable development projects. Developers may face unexpected legal and financial challenges, such as compliance costs and delays in project timelines, which can significantly increase overall expenses and reduce profitability. Unanticipated regulatory requirements can also lead to project redesigns, causing further delays and additional costs. Moreover, a lack of awareness may result in missed opportunities to engage with local communities and stakeholders effectively, leading to opposition and resistance that could hinder project approval and implementation.

Land title issues

Without a thorough title search, you could experience historical property disputes that can derail your project. Land title issues can arise from unclear ownership histories or past poorly documented agreements, leading to legal complications and delays.

Consultant errors and inexperience

Hiring inexperienced or error-prone environmental consultants can lead to delays, cost overruns, and incorrect information. Thoroughly vetting consultants and ensuring they have the necessary expertise is crucial. A good consultant should provide accurate and timely reports, helping you avoid pitfalls and make informed decisions.

02. 20 hacks for finding viable solar

These concerns above might seem daunting, but don't worry—we're here to help.

By the end of this guide, you'll have effective strategies to identify optimal solar locations. Additionally, we'll provide insights on how to conduct your comprehensive environmental due diligence, saving you time and money.



01.

Use Transect to focus on the best sites

As a developer, it is imperative to understand high-probability environmental issues early to avoid wasting time, as it can take weeks or months to get environmental reports from internal teams or external consultants. Using Transect, developers can decide quickly and confidently whether to advance a potential project site and reduce unforeseen delays and costs by identifying environmental risks early-on using unmatched data.

02.

Evaluate the cost

When assessing potential sites, ensure that the cost is reasonable and allows for future profitability. Evaluate the total investment against the projected returns. Remember, purchasing land isn't the only option. Leasing can be equally viable and often more cost-effective. Consider the long-term financial impact, including maintenance and operational costs, to ensure the project remains profitable.

03.

Consider more than just price

Price should not be the sole determining factor when choosing a site. Evaluate the overall value, including location, accessibility, and local support. Avoid rushing to the cheapest option without thorough research. Consider sites that may have higher upfront costs but offer better long-term benefits, such as lower maintenance or better sunlight exposure. Engage with the local community to gauge their support and understand potential local regulations or incentives.

04.

Utilize local expertise

Local realtors and community leaders can provide valuable insights into the area. Their knowledge of local zoning laws, land use patterns, and community sentiment can guide you in making informed decisions. Building relationships with local experts can also help navigate potential challenges and facilitate smoother project development. Their endorsements and connections can open doors and provide credibility to your project within the community.

05.

Seek referrals

Referrals from industry contacts, local businesses, and community members can help you identify potential sites without extensive legwork. Networking within the industry can lead to connections with sellers or lessors who are already interested in solar development. This approach can save time and provide access to opportunities that might not be publicly advertised. Always vet referrals thoroughly to ensure they meet your criteria and project requirements.

06.

Assess your risk tolerance

Solar development involves risks, from regulatory changes to market fluctuations. Embrace calculated risks by considering unconventional sites like brownfields or floodplains. Evaluate your risk tolerance and be prepared for competitive scenarios. Successful developers often take bold steps, balancing risk with potential reward. However, ensure you have contingency plans and risk mitigation strategies in place.

07.

Avoid shaded areas

Avoid sites with significant tree coverage, as shadows reduce solar panel efficiency. Even small trees can cast long shadows, especially in winter, diminishing energy production. Trees can also cause maintenance issues, such as debris accumulation, storm damage, and wildlife interference. Select open, unobstructed areas to maximize sunlight exposure and energy output. Consider the long-term growth of surrounding vegetation and potential shading impacts.

08.

Be cautious with prime farmland

Prime farmland may appear ideal but often comes with regulatory restrictions limiting solar development. Ensure that the land use complies with local agricultural preservation policies. Verify regulatory permissions and understand the implications of converting farmland to solar use. Consider the potential impact on local agriculture and community sentiment towards utilizing farmland for solar projects. Engage with agricultural stakeholders to address concerns and explore mutually beneficial solutions.

09.

Explore floodplains

Floodplains, often underutilized, can be suitable for solar installations. These areas typically remain undeveloped due to flooding risks, making them available for alternative uses like solar. Solar panels are durable and can withstand various weather conditions. Installing solar in floodplains can optimize land use while contributing to flood mitigation efforts. Assess the specific flood risks and design installations to withstand periodic flooding events.

10.

Keep data updated

Ensure that your natural resources and infrastructure data are current. Regulatory changes and new environmental data can impact site viability. Use integrated data systems to access the latest information and maintain compliance. Keeping data updated helps avoid costly delays and ensures informed decision-making throughout the project lifecycle.

11.

Manage natural resource issues

Identify and differentiate between manageable natural resource issues and those that could halt your project. Some issues, like specific wildlife species or wetland buffers, can be accommodated with proper planning. Others may pose insurmountable obstacles. Utilize specialized tools and expert consultations to evaluate natural resource concerns accurately. Effective management ensures compliance and minimizes environmental impact.

12.

Understand solar tolerance

Solar tolerance refers to the expected performance variation of the solar panels. The actual energy a solar farm generates is influenced by several factors, including solar capacity, sunlight exposure, weather conditions, and technological efficiency. Optimizing these factors is key to maximizing energy production (Solar Mentors, 2023).

13.

Perform preliminary evaluations

Conduct preliminary due diligence to assess the viability of potential sites. This includes evaluating environmental, regulatory, and logistical factors. Early identification of red flags can save time and resources by avoiding unsuitable sites. Detailed preliminary evaluations provide a clear understanding of each site's potential and challenges, guiding further development efforts.

14.

Conduct pre-prospecting

Before issuing requests for proposals (RFPs), prepare a comprehensive database of prospective sites. This pre-prospecting step provides a solid foundation for selecting the best locations and streamlines the development process. Utilize available data and tools to assess potential sites' suitability and feasibility. A well-prepared database ensures informed decision-making and efficient project planning.

15.

Address environmental justice

Ensure that solar projects benefit all community members, including marginalized groups. Consider the social implications of your projects and strive to provide affordable energy and job opportunities to underserved communities. Engaging with local communities and addressing their needs can enhance project acceptance and support. Incorporate environmental justice principles into your planning and decision-making processes.

16.

Plan for the long term

Solar projects can take years to develop, requiring long-term planning and adaptability. Stay informed about regulatory changes, funding opportunities, and stakeholder interests. Anticipate potential delays and challenges, and develop flexible strategies to address them. Effective long-term planning ensures project resilience and success, accommodating evolving market and regulatory landscapes.

17.

Agrivoltaics

Agrivoltaics combines agriculture with solar power, optimizing land use by integrating solar panels with farming activities. Panels can be installed over shade-tolerant crops or along field borders, increasing the productivity of farmland. This approach allows farmers to diversify their income and improve land resilience. Investigate local regulations and incentives for agrivoltaic projects to maximize benefits and compliance.

18.

Use flood control areas

Flood control infrastructure, such as levees and retention basins, offers flat, unobstructed areas ideal for solar panels. These areas are designed to manage excess water, providing stable and accessible land for solar installations. Utilizing these spaces can enhance flood management efforts while generating renewable energy. Collaborate with local authorities to ensure compliance with flood control regulations and maximize the benefits of dual-use development.

19.

Combine ranching and solar

Integrating solar panels with ranching activities can create a symbiotic relationship. Livestock can graze around solar installations without interfering with their operation. This dual-use approach maximizes land utility and provides additional income for landowners. Ensure that the design and placement of solar panels accommodate ranching activities and do not impede livestock movement or health.

20.

Consider brownfields

Brownfields, contaminated by previous industrial use, are often available for solar projects. Despite contamination, these sites can be repurposed under strict regulatory guidelines, turning otherwise unusable land into productive solar farms. The EPA has pre-screened 450,000 brownfield sites across the United States, presenting ample opportunities for solar development. Understand the remediation requirements and potential costs associated with brownfield development.

03. Checklist

Use this checklist to guide your search for the ideal solar sites.



Checklist for identifying the best solar sites

Use this checklist to guide your search for the ideal solar sites.

Utilize Transect to discover and assess project sites in minutes

- ☐ Evaluate sites faster and pinpoint environmental risks early.
- ☐ Find available capacity in seconds.
- ☐ Determine community opposition.
- ☐ Get detailed state and federal permit matrices.

Evaluate the cost

- ☐ Ensure the cost is reasonable and allows for future profitability.
- ☐ Consider both purchasing and leasing options.

Consider more than just price

- ☐ Evaluate multiple sites and consider overall value.
- ☐ Engage with the local community for support and understand local regulations.

Utilize local expertise

- ☐ Connect with local realtors and community leaders for insights.
- ☐ Build relationships with local experts to navigate challenges.

Seek referrals

- ☐ Use industry contacts and local businesses to get referrals.
- ☐ Vet referrals thoroughly to ensure they meet your criteria.

Assess your risk tolerance

- ☐ Embrace calculated risks, including unconventional sites.
- ☐ Prepare contingency plans and risk mitigation strategies.

Avoid shaded areas

- ☐ Select open, unobstructed areas to maximize sunlight exposure.
- ☐ Consider long-term growth of surrounding vegetation.

Be cautious with prime farmland

- ☐ Verify regulatory permissions for converting farmland to solar use.
- ☐ Engage with agricultural stakeholders to address concerns.

Explore floodplains

- ☐ Assess specific flood risks and design installations accordingly.
- ☐ Utilize floodplains for solar installations, optimizing land use.

Consider brownfields

- ☐ Understand remediation requirements and potential costs.
- ☐ Repurpose contaminated sites under regulatory guidelines.

Combine ranching and solar

- ☐ Design solar installations to accommodate ranching activities.
- ☐ Ensure livestock can graze around solar panels without interference.

Use flood control areas

- ☐ Collaborate with local authorities to utilize flood control areas.
- ☐ Ensure compliance with flood control regulations.

Agrivoltaics

- ☐ Integrate solar panels with farming activities.
- ☐ Investigate local regulations and incentives for agrivoltaic projects.

Plan for the long term

- ☐ Stay informed about regulatory changes and funding opportunities.
- ☐ Develop flexible strategies to address potential delays and challenges.

Address environmental justice

- ☐ Ensure solar projects benefit all community members, including marginalized groups.
- ☐ Incorporate environmental justice principles into planning and decision-making.

Conduct pre-prospecting

- ☐ Prepare a comprehensive database of prospective sites.
- ☐ Utilize available data and tools to assess site suitability.

Perform preliminary evaluations

- ☐ Conduct initial due diligence to assess site viability.
- ☐ Identify red flags early to save time and resources.

Understand solar tolerance

- ☐ Evaluate the expected performance variation of solar panels.

Manage natural resource issues

- ☐ Differentiate between manageable issues and insurmountable obstacles.
- ☐ Utilize specialized tools and expert consultations for evaluation.

Conduct deep spatial data analysis

- ☐ Use advanced spatial data analysis to uncover hidden factors.
- ☐ Incorporate spatial data insights into site evaluation and planning.

Keep data updated

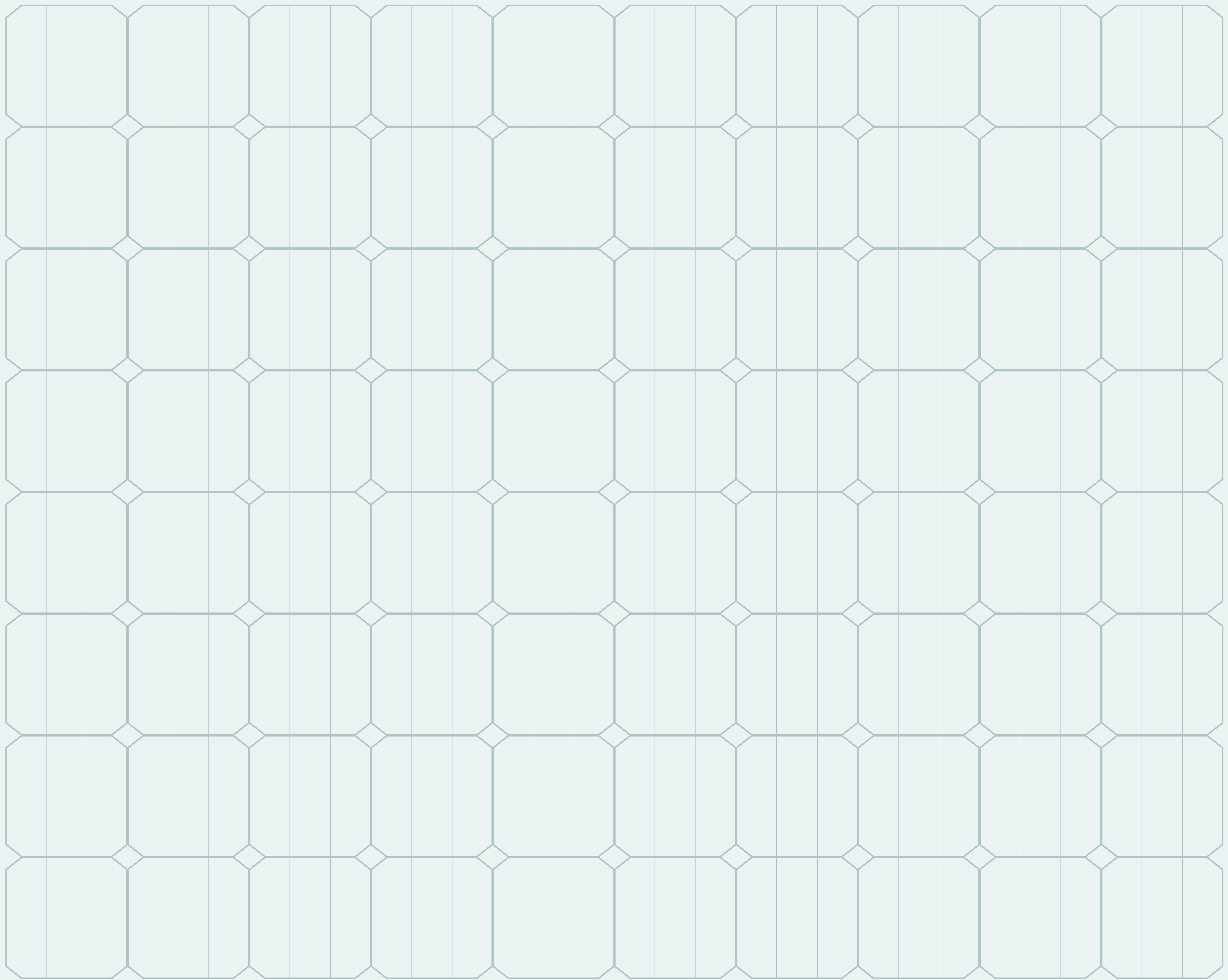
- ☐ Ensure natural resources and infrastructure data are current.
- ☐ Use integrated data systems to access the latest information

04. Discover and assess project sites in minutes



Navigating the environmental risks associated with solar development can be challenging, but with the right strategies and tools, these challenges become manageable. The twelve risks outlined in this ebook provide a comprehensive understanding of the potential hurdles, while the twenty hacks offer practical solutions to overcome them.

As renewable energy continues to grow in importance, staying informed and prepared is essential for success. For those looking to enhance their site selection process, Transect offers a powerful solution. Renewable developers can use Transect to find viable solar sites more efficiently and effectively, reducing the time and resources spent on site assessment.



Learn more about how Transect can help
de-risk your solar development projects.

Schedule a demo

