Derisking renewable energy investments

A step-by-step guide to mitigating investment risks through effective policy and finance instruments

Alexander Ochs, Maria van Veldhuizen and Blanca Loaiza, SD Strategies & LEDS GP Energy Working Group

November 2021

Increasing electricity generation using renewable energy technologies such as biomass, geothermal, hydropower, solar and wind will be essential to providing affordable, reliable, and sustainable energy access to all people worldwide and achieving the seventh of the United Nations Sustainable Development Goals (SDG 7). Scaling up renewables will also be critical for climate change mitigation and adaptation, to meet the goals of the Paris Agreement on climate change as well as the SDGs (in particular SDG 13). Many renewable energy technologies now represent cost-efficient alternatives to fossil fuels and nuclear energy and have seen record growth rates in recent years. Still, to further advance the energy transformation and achieve the goals of the Paris Agreement and the SDGs, public and private investment in the renewable energy sector will need to grow to at least double the current volume, from USD 310 billion to over USD 660 billion annually. However, too often, perceived or real risks delay or even prevent new investments in renewables at the required scale.

What is DREI?

Derisking Renewable Energy Investment (DREI) is an innovative framework developed by the United Nations Development Programme (UNDP) that aims to help governments scale up investment in renewable energy in their countries. It allows policymakers to identify barriers and risks hampering investment and to define effective policy and finance interventions to mitigate these, by either reducing, transferring, or compensating for risk. As of 2021, UNDP has published DREI toolkits for utility-scale renewable energy, interconnected rooftop PV, off-grid mini-grids and solar home systems. These toolkits also allow governments to calculate the levelized cost of electricity (LCOE) pre- and post-implementation of risk-mitigating instruments.

SD Strategies, a Berlin-based think tank and facilitator of the Energy Working Group of the Low Emission Development Strategies Global Partnership (LEDS GP) until June 2021, has pioneered the use of this ground-breaking instrument in Africa and Latin America, adapting the methodology for interconnected mini-grids in Nigeria and for biogas in Colombia. The resulting reports, Derisking Interconnected Solar Mini-Grid Investments in Nigeria and 'De la Práctica a la Política: Análisis de las Barreras a la Inversión en Biogás en Colombia` (to be found here) provide concrete advice for shaping sound market frameworks and thus improving investment environments. The studies were authorized by the Energy Commission of the Government of Nigeria (ECN) and Colombia's Low Carbon Strategy at the Ministry of Energy and Mining (Minenergia). They were supported by the Global Environment Facility (GEF) and UNDP, as well as LEDS GP and its LEDS LAC regional platform for Latin America and the Caribbean.

This Handbook presents a quick start guide to the DREI methodology as we have adapted it. The step-by-step guide below is based on UNDP's original toolbox but limited to two key components that can deliver valuable and practical input for public decision making: the assessment of risks and barriers in a specific renewable technology market and the identification of policy and finance instruments that have the potential to mitigate these; as well as the design of a policy mix targeting the full range of the most severe barriers and the most effective instruments. Accompanying modelling exercises such as levelized cost of electricity (LCOE) analysis are not discussed here but can further improve market analysis as well as policy and finance reform.

Is DREI the right methodology for me?

DREI analysis can in principle be applied to any renewable energy technology in any country. However, full toolkits have thus far only been developed for a limited number of technologies (see above). Applying the methodology to a different technology will require greater investment to identify the relevant risks and barriers on the one hand, and the policy and finance instruments on the other.

As the recommendations resulting from a DREI analysis take the form of public instruments, this work should be performed by or on behalf of government departments or agencies that have the authority to adopt and implement these instruments. Cross-ministerial and cross-sectoral coordination from the start is desirable, as many of the most impactful instruments will require participation and support from various agencies (energy, environment, infrastructure, finance within national, provincial and/or local authorities).

A well-performed DREI analysis can be a powerful instrument to justify and build support for a finance, policy, and regulatory mix, both domestically and among international partners and funders.

How to use the DREI methodology?

This section provides a step-by-step guide to employing the DREI methodology for the renewable energy technology of your choice. If you want to apply the DREI framework to a technology for which a full toolkit has been produced (links to access all available toolkits can be found at https://sd-strategies.com) you may skip steps 1 and 2. Otherwise, start with step 1.

1. Identify risks and barriers to investment

Investor risk can be defined as "the product of the probability of a negative event occurring and the potential financial impacts to the investor of such a negative event, should it occur". Investors make decisions based on their perception of risk, which is higher when information is lacking, markets or regulations are intransparent, or investors are simply unfamiliar with the market. Therefore, transparency and information provision should form a large part of any risk mitigation strategy.

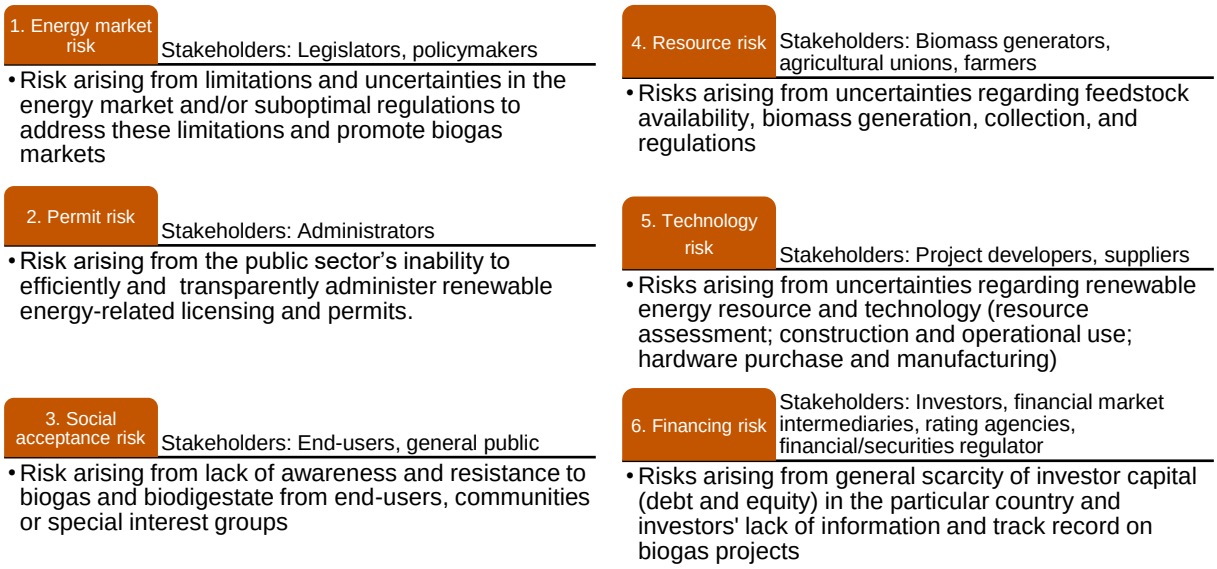
Investor risks can be mitigated by reducing underlying barriers. For example, one of the barriers causing power market risk, which arises from limitations and uncertainties in the electricity market, are market distortions caused by high fossil-fuel subsidies.

This first methodological stage is composed of three steps:

1.1 Identify stakeholders. Begin by identifying the core stakeholders whose behavior can affect, directly or indirectly, an investor's renewable energy activities. Stakeholders can include project developers, utility companies, end users, legislators, and others.

1.2 Identify barriers. Define the range of possible barriers associated with the identified stakeholder groups. This step requires a systematic analysis of the local market for the renewable energy technology of interest. This analysis can be done through a literature review and initial stakeholder interviews.

1.3 Identify risk categories. Aggregate the identified barriers into risk categories according to the stakeholder groups that you believe should address them. Besides the stakeholder-based categories, include national-level risk categories related to the general investment environment. These final risk categories usually reflect political and macro-economic risk. Sample risk categories relevant to biogas can be found in the image below.



2. Match risks and barriers with derisking policy and finance instruments

In the second step, extend the stakeholder barrier and risk table by identifying and describing the public instruments required to address each barrier. The instruments identified to address the risks are usually divided into two groups:

Policy derisking instruments. These measures aim to enable investment, by removing the barriers which are the root causes of project risks. They include the full range of renewable energy policies and support mechanisms, such as feed-in tariffs or renewable Energy tendering schemes; administrative reforms such as the development of time- and cost-efficient permit application procedures; and other measures such as public awareness campaigns, stakeholder dialogues or community engagement initiatives.

Financial derisking instruments. These finance measures often do not mitigate the barriers directly but transfer project risks from investors to public actors. This category includes

instruments such as loan guarantees, political risk insurance (PRI), and currency exchange hedging.

3. Create an expert survey

Based on the table that matches stakeholders, barriers, and risks, as well as policy and finance instruments, create a survey that will allow experts to assess the severity of each risk and the effectiveness of each instrument in addressing it. Experts should be asked to estimate both the likelihood of the barrier occurring in their country as well as the severity of the impacts should the barrier actually occur. These two elements will constitute the overall barrier score; added up and averaged, the barrier scores will give the overall score for each risk category.

An example setup of the quantitative section of the survey is presented below.

4. Identify experts

In this step, identify the experts you will ask to complete the survey. Include representatives of the relevant stakeholder groups, such as regulators, investors, project developers, and market analysts. To accurately assess the severity of the various risks and the effectiveness of countermeasures, they must have sufficient knowledge of the specific renewable energy technology, the respective market, and the regulatory and investment dynamics in their country. Collating a diverse group of experts will ensure that the full spectrum of relevant perspectives is represented.

Example survey questions

Rate the probability of the barrier occurring from 1 – ‘highly unlikely' to 5 – ‘highly likely'

Rate the impact of the barrier, should it occur, from 1 - 'very low impact' to 5 - 'very high impact'

Rate the effectiveness of these public instruments in addressing the identified risk from 1 - 'ineffective effective' to 5 - 'extremely effective'

Expert ratings will be converted into scores using the following scale:

1 – highly unlikely / very low impact / ineffective;

2 – unlikely / low impact / slightly effective;

3 – neither unlikely nor likely / moderate impact / moderately effective;

4 – likely / high impact / highly effective;

5 – highly likely / very high impact / extremely effective.

5. Pursue interviews with quantitative and qualitative answers

Interview the selected experts, asking them to give both quantitative and qualitative answers. For the quantitative component, use a likelihood/impact/effectiveness scale (e.g., along the lines of the scale provided above). The responses will be converted into scores in the next step. Interviewees’ qualitative explanations should justify their ratings of each barrier and instrument.

6. Review & rank risks/barriers and policy/finance instruments

Convert the experts' ratings into scores and calculate averages for each barrier and instrument. Rank barriers by severity to identify the risks and barriers that must be most urgently addressed. If expert assessments vary widely for any of the barriers or instruments (e.g. some experts rate 'finance risk' as 'very low impact' while others rate it as 'very high impact'), investigate further by consulting their explanations, undertaking additional desk research, or conducting additional interviews.

7. Design a policy mix to address the full range of most critical risks

Based on the rankings created in the previous step, design a policy mix to accelerate investment in the chosen renewable energy technology. Prioritize instruments that:

- Address the highest-ranked barriers
- Are highly effective, cost-efficient, and politically and financially feasible

Ultimately, you may want to suggest a mix of easily implementable, quick-fix instruments and more complex/resource intensive instruments that are impactful but require more time to be implemented and/or to achieve results.

What to do with the results of the analysis?

It is important that the results of your DREI analysis are not viewed as static. As the renewable energy sector continues to grow and develop rapidly, technology options, costs, market participants, investor focuses, public interests, and available capital will continue to change. As a result of these developments, the importance of barriers will also change; some may become more or less severe, some may disappear, and new barriers may take their place. Finally, growing global experience with mitigation instruments will result in new insights into their costs and benefits and will allow you to refine these instruments over time. For these reasons, the analysis should be reviewed regularly and updated if there are signs that it may be outdated.

The outcomes of DREI analyses are usually presented in the form of reports. These should provide concise, detailed, technical insights, while at the same time remaining accessible and useful to high-level decisionmakers. The reports should be used as an evidence base for debates about policy, administrative, and financial reforms, and can be used to support requests for technical and financial assistance from international sources.

To ensure that the analysis can lead to real policy reform that improves the market environment and leads to accelerated investment in renewable energy, reports should include a summary for decisionmakers, be enhanced by compelling visuals, and accompanied by case studies on existing projects in the specific market, ideally from the country or region. They should be made accessible to all relevant public and private decisionmakers, as well as the general public.

A report should be presented to the government as a basis for discussions of concrete policy reform proposals. Ideally, the DREI analysts should be part of the continuing discourse to guide the process from analysis to policy design and implementation.