

**DERISKING RENEWABLE ENERGY INVESTMENT (DREI)****DERISKING MATRIX****TECHNOLOGY: UTILITY-SCALE RENEWABLE ENERGY****KEY ASSUMPTIONS:** 1. Table applicable to on-shore wind, solar PV. Other technologies (hydro, biomass) will require adjustments.**# RISKS, BARRIERS:** 11, 21**VERSION** 3.0**UPDATED AS OF:** 31-Jul-17

BARRIERS			
Risk Category	Description	Underlying Barriers	Key Stakeholder Group
1. Power Market Risk	Risk arising from limitations and uncertainties in the energy market, and/or sub-optimal regulations to address these limitations and promote energy markets	<i>Market outlook:</i> lack of or uncertainties regarding governmental renewable energy strategy and targets	Power sector policymakers, legislators, regulators
		<i>Market access and prices:</i> limitations related to energy market liberalization; uncertainties related to access, the competitive landscape and price outlook for renewable energy; limitations in design of standard PPAs and/or PPA tendering procedures	
		<i>Market distortions:</i> such as high fossil fuel subsidies	
2. Permits Risk	Risk arising from the public sector's inability to efficiently and transparently administer renewable energy- related licensing and permits	<i>Bureaucracy:</i> Labour-intensive, complex processes and long time-frames for obtaining licences and permits (generation, EIAs, land title) for renewable energy projects	Public sector administrators
		<i>Transparency:</i> Perceived corruption. No clear recourse mechanisms	
3. Social Acceptance Risk	Risks arising from lack of awareness and resistance to renewable energy from end-users, special interest groups	<i>Awareness :</i> Lack of awareness of renewable energy amongst key stakeholders including: end-users, local residents and special interest groups (e.g. unions)	End-users, general public, media, special interest groups
		<i>Resistance:</i> Social and political resistance related to NIMBY concerns, special interest groups	
4. Hardware Risk	Risk arising from limitations in the quality and availability of utility-scale hardware; issues arising from inefficiencies in the customs process	<i>Quality, suitability and availability of hardware:</i> Lack of access to information on quality, reliability (performance) and cost of hardware; unsuitability of hardware to local conditions; limitations in infrastructure (e.g. roads) impacting transport	Hardware supply chain; customs (excise)
		<i>If applicable, local content requirements and manufacture of hardware:</i> challenging local content requirements; lack of local industrial presence and experience with manufacturing hardware	
		<i>Customs:</i> Cumbersome customs/clearing process for importing hardware, leading to delays in delivery; where applicable, punitive customs tariffs	
5. Labour Risk	Risks arising from the lack of skilled and qualified potential employees	Lack of a competitive labour market of educated, skilled and qualified potential employees, leading to higher costs, hiring non-local staff and suboptimal performance	Labour force; training/ education institutions
6. Developer Risk	Risks arising from limitations in the IPP's management capability and ability to execute on financing and business plan	Lack of C-suite talent and experience to ensure effective execution (business planning, securing financing, resource assessment, plant design, operations and maintenance) and to manage challenges (limited information, unforeseen events)	

\* Note: This instrument can be/have elements of a direct financial incentive

PUBLIC INSTRUMENTS			
Policy Derisking Instruments		Financial Derisking Instruments	
Activity	Description	Activity	Description
Establish transparent, long-term national renewable energy strategy and targets	Regular updates of national energy planning, including national-level resource inventory/mapping, technology options, and renewable energy target formulation		
Establish a harmonized, well-regulated energy market, with cornerstone instruments to address price and market-access risk for renewable energy projects	(i) Ongoing legislative reform to implement well-designed and harmonized policies; (ii) establish an independent energy market regulator; (iii) Implement FIT and PPA tendering*, including well-designed standard PPA		
Reform of fossil fuel subsidies	Assessment of fuel subsidies, phase-out/down of subsidies, awareness campaigns, design of transfer programs to affected groups		
Streamline processes for permits	Establish a one-stop-shop for renewable energy permits; reduction of process steps; clear timelines for processing; harmonisation of requirements		
Contract enforcement and recourse mechanisms	Enforce transparent practices and fraud avoidance mechanisms; establish effective recourse mechanisms, with clear timelines for resolution		
Awareness-raising campaigns	Implement active publicity, media and awareness campaign targeting key stakeholder groups		
Promote community based projects	Establish favourable local (e.g. municipal) policies and pilot community owned renewable energy projects); assist in establishing appropriate legal vehicles for community models	Financial products by development banks expressly targeting community projects and legal vehicles	Depends on specific circumstances, can include, as necessary: public loans; public guarantees for commercial loans; public equity; currency and concessionality of products may vary
Technology standards; research and development	Test centre for research and development into product adaptation, such as wind turbine adaptation to local conditions; government efforts to facilitate transport (e.g., flexible application of road transport rules)		
Harmonized approach to local content and industrial policy	Balanced and phased local content requirements; industrial policy for domestic manufacturing	Financial products by development banks to assist domestic manufacturers in gaining access to capital	Depends on specific circumstances, can include, as necessary: public loans; public guarantees for commercial loans; public equity; currency and concessionality of products may vary
Streamlined and consistent customs procedures; considered approach to customs tariffs	Reduction of customs administrative steps; public response timelines; effective and expedited recourse mechanisms. Full cost-benefit economic assessment and benchmarking of tariffs; phase-out/down of punitive tariffs; introduction of import tariff holidays and VAT exemptions*		
Programmes to develop competitive, skilled labour market in utility-scale renewable energy (all roles)	Apprenticeships, certificates and education programmes to build skills in utility-scale renewable energy (engineering, installation, marketing, business management)		
Government support to grow early-stage industry	Government support for establishing industry association; government support for initial industry conferences; dissemination of top-level, national resource assessment findings; government sponsored academic studies		

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Risk Category	Description	Underlying Barriers	Key Stakeholder Group
7. Grid/ Transmission Risk	Risks arising from limitations in grid management and transmission infrastructure	<i>Grid code, management and connection:</i> Lack of standards for the integration of intermittent, renewable energy sources into the grid; limited experience or suboptimal track-record in grid management and stability; lack of responsiveness and delays in connection of new renewable energy sources to the transmission network	Transmission/ grid operator
		<i>Transmission infrastructure:</i> inadequate or antiquated grid infrastructure, including high transmission losses, and lack of lines from the renewable energy source to load centres; uncertainties for construction of new transmission infrastructure	
8. Off-Taker Credit Risk	Risks arising from the off-taker's poor credit quality and an IPP's reliance on payments	Limitations in the off-taker's (electricity purchaser's) credit quality, corporate governance, management and operational track-record or outlook; unfavourable policies regarding off-taker's cost-recovery arrangements	Off-taker (typically the utility, distribution company)
9. Financing Risk	Risks arising from general scarcity of investor capital (debt and equity) in the particular country, and investors' lack of information and track record in utility-scale renewable energy	<i>Capital scarcity - under-developed domestic financial sector:</i> Low number of financial actors (debt, equity, insurance, pensions)	Domestic investors (equity and debt); financial market intermediaries; rating agencies; financial/ securities regulator
		<i>Capital scarcity - liquidity constraints in domestic banking:</i> Limited availability of long term domestic loans due to high banking reserve requirements	
		<i>Capital scarcity - competing incentives/ mandates:</i> domestic financial sector (banks, pension funds) mandated to invest in alternative, competing sectors	
		<i>Limited experience with utility-scale renewable energy:</i> Lack of information, assessment skills and track-record for renewable energy projects amongst investor community; lack of network effects (investors, investment opportunities) found in established markets; lack of familiarity and skills with project finance structures	
10. Currency Risk* <i>*Note this risk category only applies if financing is in hard currency.</i>	Risks arising from currency mismatch between hard currency debt/equity and domestic currency revenues	Uncertainty due to volatile local currency; unfavourable FX rate movements; inability to economically hedge FX exposure due to illiquid FX derivative markets.	Macro risk
11. Sovereign Risk	Risk arising from a mix of cross-cutting political, economic, institutional and social characteristics in the particular country which are not specific to utility-scale renewable energy	Limitations and uncertainty related to conflict, political instability, economic performance, weather events/natural disaster, legal governance, ease of doing business, crime and law enforcement, and infrastructure in the particular country	Macro risk

STUDY'S PUBLIC INSTRUMENTS			
Policy Derisking Instruments		Financial Derisking Instruments	
Activity	Description	Activity	Description
Strengthen transmission operator's operational performance, grid management and formulation of grid code	(i) Develop a grid code for new renewable energy technologies; (ii) sharing of international best practice in grid management; (iii) establish timing targets for connection of new renewable sources to the grid	Include a "take-or-pay" clause in the standard PPA	"Take-or-pay" clause in PPA whereby IPP is reimbursed for grid failure (black-out, brown-out) and/or curtailment (due to mismatches in grid management of supply/demand)
Policy support for national grid infrastructure planning and development	Develop and regularly update a long-term national transmission/grid plan to include intermittent renewable energy	Financial products by development banks to transmission companies in gaining access to capital	Depends on specific circumstances, can include, as necessary: public loans; public guarantees for commercial loans; public equity; currency and concessionality of products may vary
Strengthen off-taker's performance	Establish international best practice in off-taker's management, operations and corporate governance; implement sustainable cost recovery policies	Government and/or development bank guarantees for PPA payments	Government (e.g., Ministry of Finance) letter of support for PPA payments to IPPs; development bank partial risk guarantee for PPA payments; development bank public loans to IPPs
Liberalise domestic financial sector	Liberalisation and introduction of competition into domestic financial sector	Financial products by development banks to assist IPPs to gain access to capital/funding	Depends on specific circumstances, typically public loans; currency and concessionality of products may vary
Reform reserve requirements for domestic lending to businesses	Balanced approach to liquidity requirements, assessing trade-offs between financial stability and renewable energy/electrification objectives		
Reform financial sector incentives for investing in specific sectors	Balanced approach to incentives across all sectors; introduce incentives, targets and mandatory lending requirements for renewable energy/SHS/electrification		
Strengthen domestic investors' (debt, equity, institutions, intermediaries) familiarity with and capacity regarding on-grid rooftop PV and aggregative financing models	Dialogues, events and conferences for utility-scale renewable energy; sharing of successful project finance structures; workshops/training for investors on utility-scale renewable energy assessment		
Government support for long term development of liquid domestic FX derivative markets	Regulatory reforms enabling derivative trading for local securities exchanges; steering of large government FX hedging contracts to domestic FX markets.	Risk sharing mechanisms to address currency risk	Partial indexing of local currency tariffs in PPAs, so that IPPs are reimbursed for local currency depreciation of tariff
		Risk sharing products by development banks to address political risk	Provision of political risk insurance to equity holders covering (i) expropriation, (ii) political violence, (iii) currency restrictions and (iv) breach of contract