

# Derisking Renewable Energy Investment

## Cost-effective Interventions for Affordable Renewable Energy

### Derisking the Tunisia Solar Plan

Lucas Black

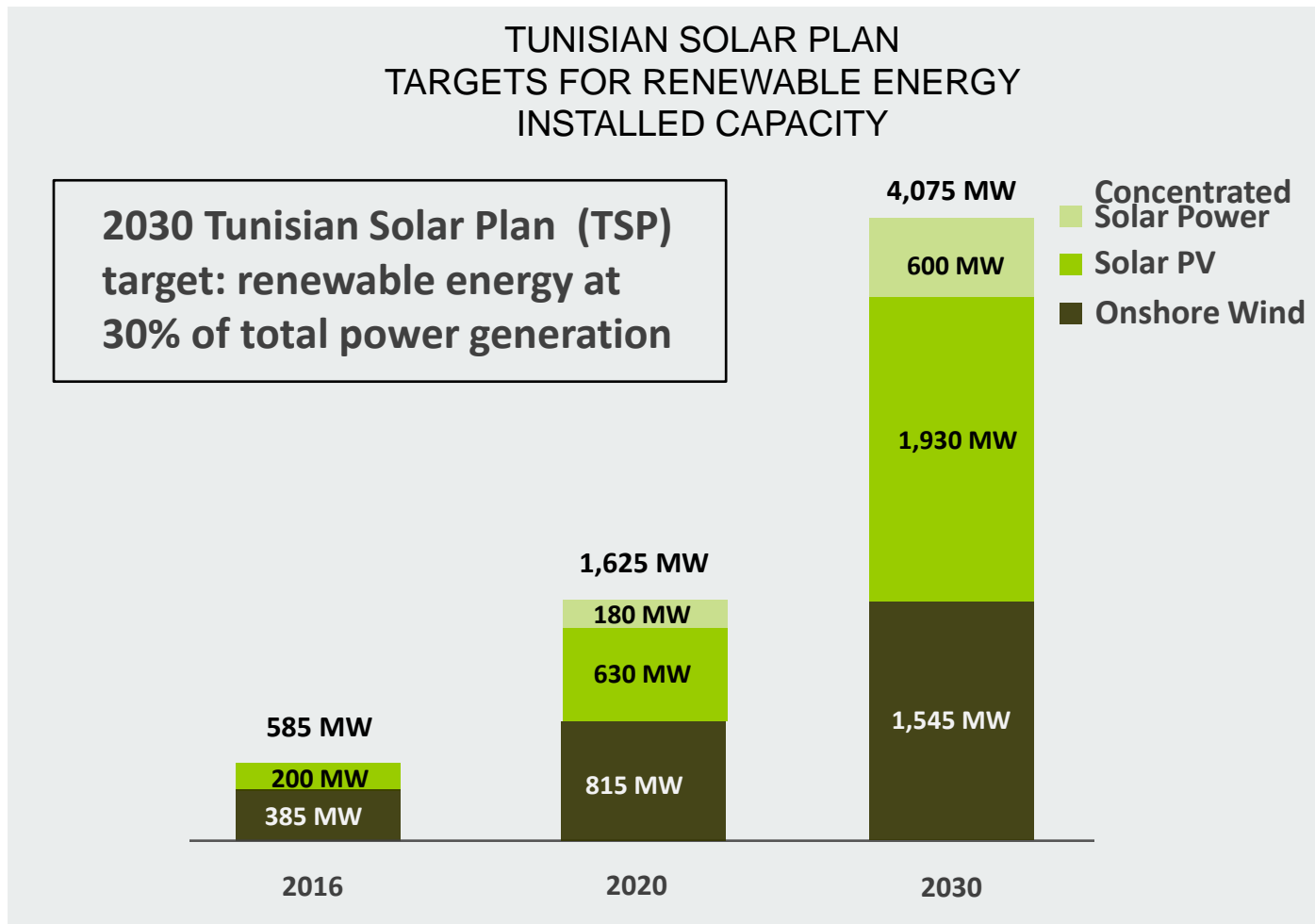
Regional Team Leader and Technical Advisor – Energy, Infrastructure, Transport and Technology  
UNDP – Global Environmental Finance

IEA-EBRD Regional Stakeholder Workshop on Low-Carbon Technologies  
June 15<sup>th</sup>, 2015



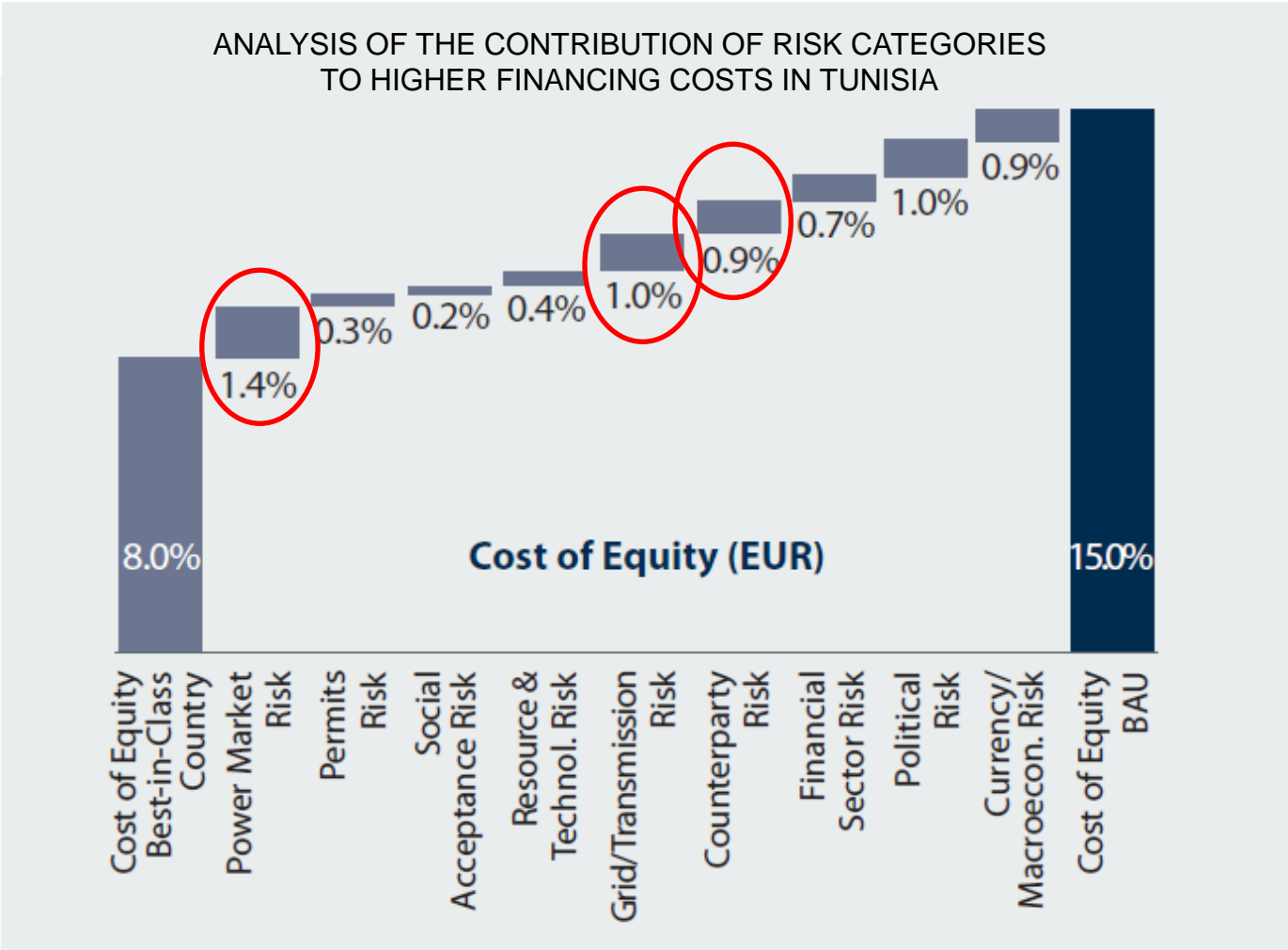
# Introduction

## The Tunisian Solar Plan



# Derisking the Tunisia Solar Plan

## Financing cost waterfall (solar PV)



Source: UNDP,/ANME, Tunisia: Derisking Renewable Energy Investment (2015).

# Derisking the Tunisian Solar Plan

## Selecting public instruments (solar PV)

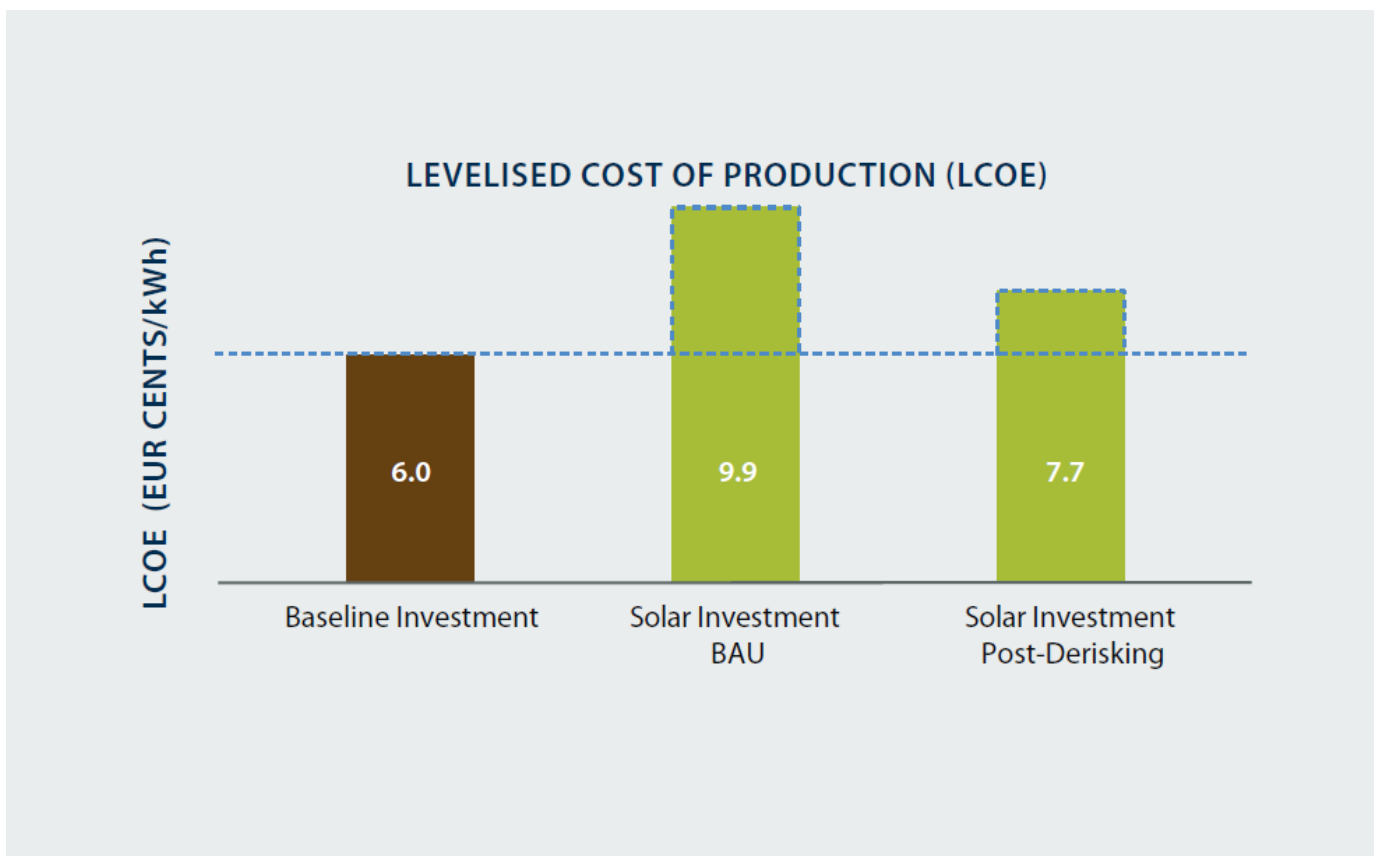


RISK CATEGORY	POLICY DERISKING INSTRUMENTS	FINANCIAL DERISKING INSTRUMENTS
<b>Power Market Risk</b>	<ul style="list-style-type: none"> <li>• Long term renewable energy targets</li> <li>• Regulatory framework</li> <li>• FIT/PPA tender (standardised PPA)</li> <li>• Independent regulator</li> </ul>	NA
<b>Permits Risk</b>	<ul style="list-style-type: none"> <li>• Streamlined permitting; one-stop shop; recourse mechanism</li> </ul>	NA
<b>Social Acceptance Risk</b>	<ul style="list-style-type: none"> <li>• Awareness-raising campaigns</li> <li>• Promote/pilot community-based approaches</li> </ul>	NA
<b>Resource &amp; Technology Risk</b>	<ul style="list-style-type: none"> <li>• Resource assessment</li> <li>• Technology support (solar PV)</li> </ul>	NA
<b>Grid/Transmission Risk</b>	<ul style="list-style-type: none"> <li>• Transparent, up-to-date grid code</li> <li>• Grid management/planning</li> </ul>	<ul style="list-style-type: none"> <li>• Take or pay clause in PPA<sup>11</sup></li> </ul>
<b>Counterparty Risk</b>	<ul style="list-style-type: none"> <li>• Strengthen utility's management</li> </ul>	<ul style="list-style-type: none"> <li>• Government guarantee of PPA</li> </ul>
<b>Financial Sector Risk</b>	<ul style="list-style-type: none"> <li>• Domestic financial sector reform</li> </ul>	<ul style="list-style-type: none"> <li>• Concessional public loans to IPPs</li> </ul>
<b>Political Risk</b>	NA	NA
<b>Currency/Macroeconomic Risk</b>	NA	<ul style="list-style-type: none"> <li>• Partial indexing of PPA tariffs to foreign currencies<sup>12</sup></li> </ul>

# Derisking the Tunisian Solar Plan

## Measuring impact (solar PV)

---



# ***Derisking the Tunisian Solar Plan***

## **Measuring impact (solar PV. 0.7 GW to 2030)**

---



If **EUR 145 million** is invested in public derisking measures to promote solar PV in Tunisia, this can have the following impacts:



### **Catalysing private sector funding**

- EUR 935 million in private sector investment



### **Generating economy-wide savings**

- EUR 359 million in savings over 20 years



### **Better affordability for end-users**

- Wind energy generation costs decrease from EUR 9.9 cents/kWh to EUR 7.7 cents/kWh



### **Benefit the environment**

- Emission reductions of 33Mt CO<sub>2</sub>e over 20 years

# UNDP derisking methodology

## Key take-aways

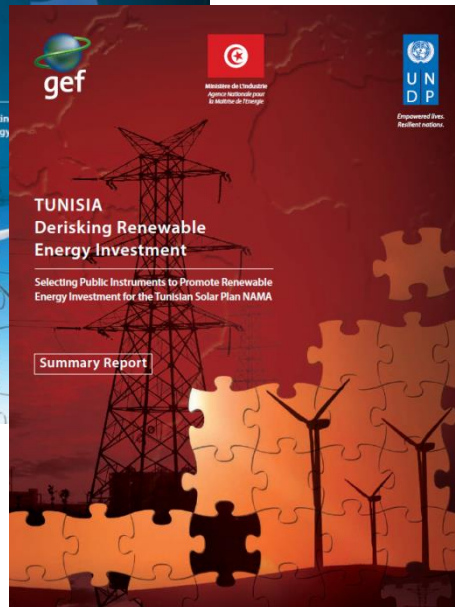
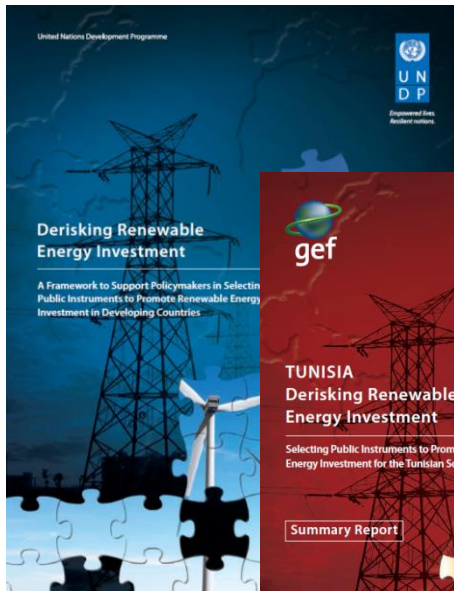
---



- With technology costs for renewable energy having fallen in recent years, a key opportunity for policymakers is to address the high financing costs for renewable energy in developing countries
- Take-aways from the derisking methodology:
  - The best outcomes occur when policymakers address the risks to renewable energy investment in a systematic and integrated way
  - Even with feed-in tariffs (FiT) and other similar cornerstone instruments in place, there may be residual risks that block investment
  - Investing in derisking appears to be cost effective when measured against paying direct financial incentives, such as a FiT premium
- To date, the derisking approach has been developed for large-scale renewable energy
  - Future applications of the derisking methodology include aggregative models for distributed renewable energy and energy efficiency.

# UNDP derisking methodology

## Website, reports & financial tools



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	UNDP, VERSION 1.0 (APRIL 2013)																
2																	
3	<b>DERISKING RENEWABLE ENERGY INVESTMENT</b>																
4	<b>FINANCIAL TOOL</b>																
5																	
6																	
7																	
8																	
9																	
10	<b>A. OVERVIEW</b>																
11																	
12	This financial tool supports the framework presented in UNDP's <i>Derisking Renewable Energy Investment</i> report to assist policymakers in selecting public instruments to promote renewable energy investment. The financial tool calculates the levelised cost of electricity (LCOE) for a given country's baseline energy mix and the LCOE of onshore wind energy, before and after the introduction of public instruments.																
13																	
14	Please go to UNDP's website to download the report, latest versions of this financial tool and other materials:																
15	<a href="http://www.undp.org/content/undp/en/home/library/page/environment-energy/low_emission_climate/resilient/development/derisking-renewable-energy-investment/">http://www.undp.org/content/undp/en/home/library/page/environment-energy/low_emission_climate/resilient/development/derisking-renewable-energy-investment/</a>																
16																	
17																	
18																	
19																	
20																	
21	This financial tool is organised into the following eight sheets:																
22																	
23	<b>I. Summary Outputs</b>																
24	<b>II. Inputs, Baseline Energy Mix</b>																
25	<b>III. Inputs, Wind Energy</b>																
26	<b>IV. LCOE, Baseline Energy Mix</b>																
27	<b>V. LCOE, Wind Energy</b>																
28	<b>VI. Additional Data</b>																
29	<b>VII. Supplementary Information</b>																
30	<b>VIII. User Notes</b>																
31																	
32	<b>C. IMPORTANT GUIDANCE</b>																
33																	
34	The following modelling conventions are used throughout this tool:																
35																	
36	<b>Input cells</b>																
37	- Input cells require the user to enter numeric data or to select an option from a drop-down menu.																
38	- Input cells are formatted in <b>blue font</b> . An example of the format is as follows: <input type="text" value="\$0"/>																
39	- Sometimes input cells may be formatted in <b>purple font</b> . This signifies that default input data is inserted to act as an initial guide. Users are invited to input their own data.																
40																	
41	<b>Output cells</b>																
42	- An output cell consists of a pre-existing formula. Do NOT enter data into an output cell. If the formula is overwritten, this could compromise the financial tool.																
43	- Output cells are formatted in <b>black font</b> .																
44																	
45	<b>Guidance comments</b>																
46	- The input sheets have a column with guidance comments. These comments provide explanatory notes, definitions and address common issues.																
47	- The column with guidance comments is initially hidden from view. To view the comments click on the ungroup symbol (which appears as a "+" sign) in the top right-hand corner of the sheet.																
48																	
49																	
50	<b>Checks</b>																
51	- Check cells will appear when there is an invalid entry of some sort. Check cells are formatted in <b>red font</b> . If it appears, the check cell provides guidance on how to rectify the invalid entry.																
52																	
53	<b>Protected sheets and cells</b>																
54	- In order to ensure that the tool maintains its functionality and formulae are not accidentally deleted and/or compromised, this tool is distributed with sheets and cells in 'protected' mode.																
55																	
56																	
57	Introduction   I. Summary Outputs   II. Inputs, Baseline Energy Mix   III. Inputs, Wind Energy   IV. LCOE, Baseline Energy Mix   V. LCOE, Wind																
58	Ready																