



# Enabling PV Nigeria

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# GERMAN SOLAR ASSOCIATION AT A GLANCE

**TASK** To represent the solar industry in Germany in the thermal and photovoltaic and storage sector

**VISION** A sustainable global energy supply provided by solar (renewable) energy

**ACTIVITIES** Lobbying, political advice, public relations, market observation, standardization

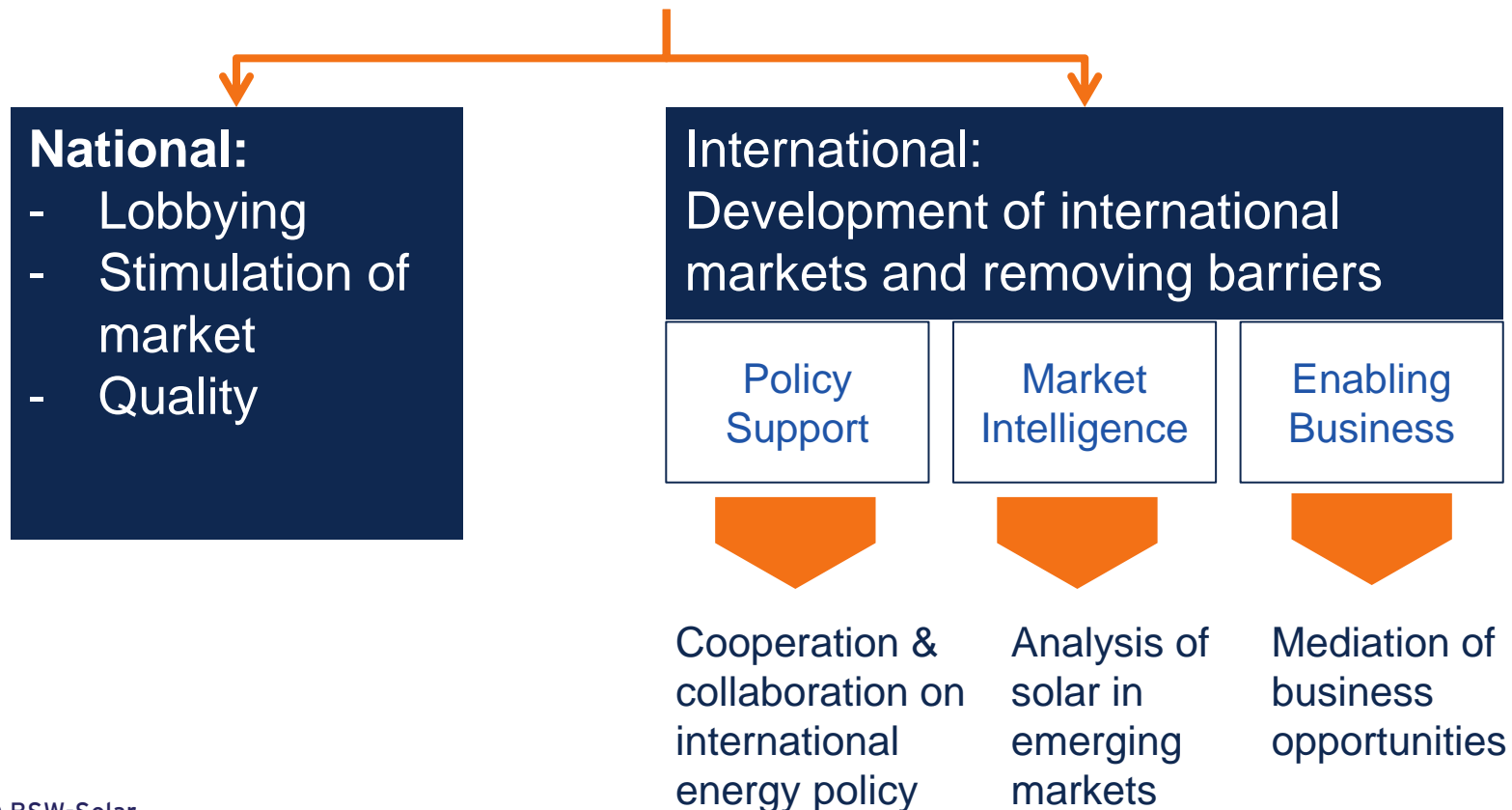
**EXPERIENCE** Active in the solar energy sector almost 40 years

**REPRESENTS** More than 600 solar producers, suppliers, wholesalers, installers and other companies active in the solar business from all over the world

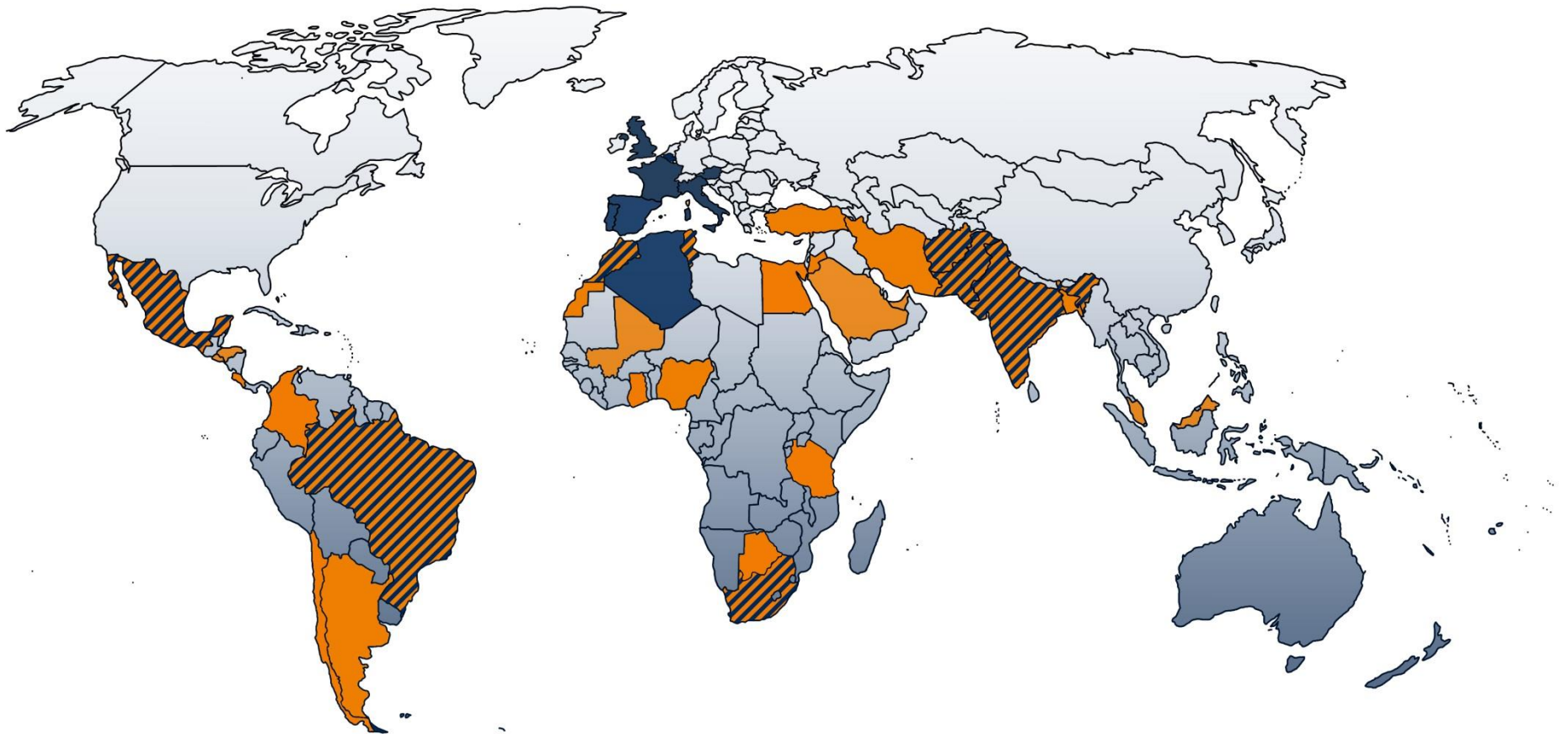
**HEADQUARTERS** Berlin



The Association serves the interests of our members within two scopes



# BSW-Solar: Working worldwide to improve frameworks for the use of solar energy!



 Partnerships,  
business networks

 Projects, Market reports,  
esp. "Enabling PV"

 both

# ENABLING PV: Study series to identify business models for PV and analyze economics / develop recommendations



- BSW search target countries which offer attractive funding schemes or favorable conditions for conveying free business models
- Projects provide "instruction manuals" for market entry and project development. (<https://www.solarwirtschaft.de/enabling-pv.html>)



## PV in Nigeria: objectives of cooperation

- Develop and foster the **most viable business models** for solar PV in Nigeria
- **Identify and improve the legal and administrative framework** for business models
- **Detect and tackle the existing barriers** hindering the implementation of the business models
- **Extend the Online Tools** to allow investors to calculate different business models
- **PR and awareness building** and try to attract investment, foster cooperation

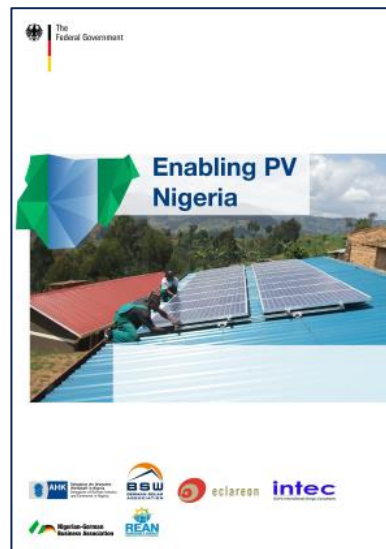
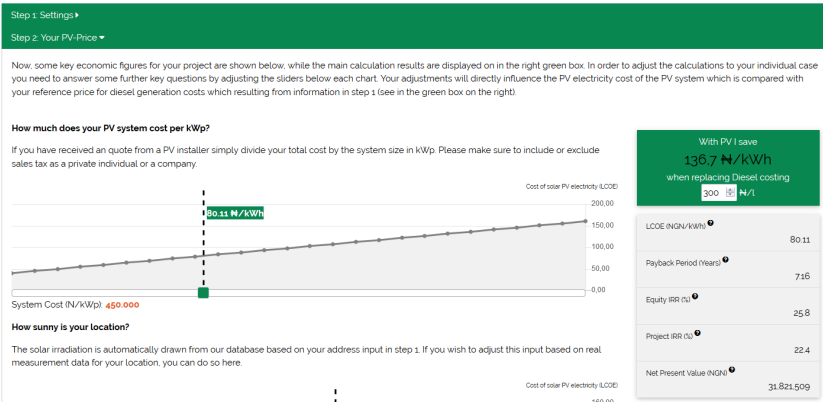
This is a team effort of Nigerian-German experts:



Funded by the Federal Foreign Office

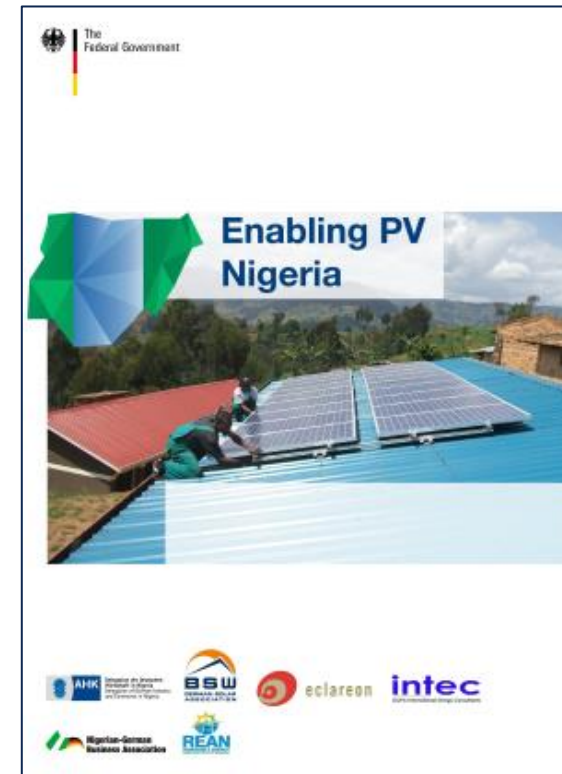
# Key Outputs of Enabling PV Nigeria

- Online Tools on PV profitability for selected business cases
- Workshops in Lagos and Abuja
- Market report and guideline



# Outline of the Study

- Overview of the Nigerian energy market
- Status of Nigerian PV Sector
- Presentation of selected PV Business models
- Success factors for developing PV projects





# ENABLING PV NIGERIA: Spotlight on most relevant PV business cases in the country.



- 1. Large ground-mounted Solar PV system** with on-grid generation license for the transmission grid, with off-taker as NBET. (25-50 MWp)
  - 2. Embedded PV system** with self-consumption for commercial/industrial applications including on-grid generation license for the distribution grid with Off taker as DISCO. (1-5 MWp)
  - 3. Captive Diesel-PV hybrid** generation to replace/assist existing diesel generators under the current regulation/permission. Option for PV battery integration. (100-1.500 kWp)
  - 4. Off-grid PV-hybrid mini grids** for supply of remote communities under off-grid generation license and distribution license. (10-250 kWp)
- (Roof-top Solar Home Systems** for off-grid households. (0,05-0,2 kWp))

## Status of Nigerian PV sector

- High population rate with 191 million & growing economic development result into increased need for electricity
- Energy supply is unstable and unreliable, diesel generators dominate electricity production
- Industrial customers are promising target for PV: 8-14 GW of installed diesel capacity
- Only 4% of industrial energy need from grid. Rest is self produced through gas, diesel, biomass.
- FiT in force, 50% procurement goal for RE by DisCos
- 0% customs on solar components, however, 20% on batteries and 5% on inverters

# Challenges for PV development in Nigeria

- **Negative perception due to bad quality products** (Standards and specifications for components, weak value chains)
- **Access to finance** and financial conditions in local banks (high interest rates, short payback period, Limited understanding of the technology, missing reference projects)
- **Payment collection:** Willingness and ability of customers to pay
- **Capacity building:** regulators, utilities, project developers/installers, financial Institutions, customers
- **Increase transparency and improve the regulation:** the lack of institutional capacity, tax issues and many laws and regulation create anti-trust between government and business interested people
- Short term: elections 2019

# ENABLING PV NIGERIA: Online Calculator for diesel-PV hybrid business case



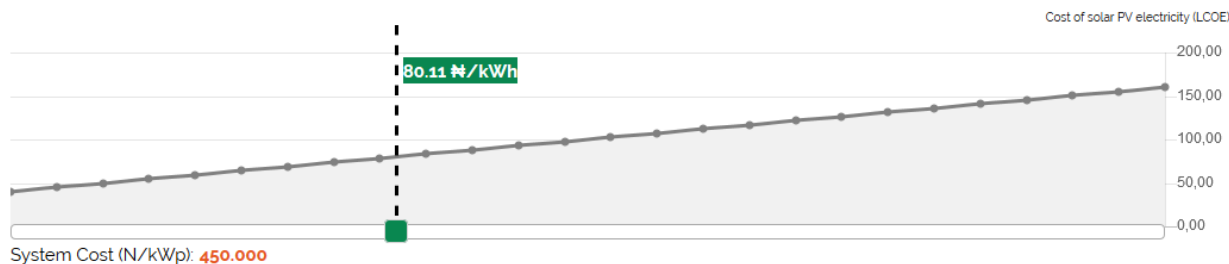
Step 1: Settings ▶

Step 2: Your PV-Price ▼

Now, some key economic figures for your project are shown below, while the main calculation results are displayed on in the right green box. In order to adjust the calculations to your individual case you need to answer some further key questions by adjusting the sliders below each chart. Your adjustments will directly influence the PV electricity cost of the PV system which is compared with your reference price for diesel generation costs which resulting from information in step 1 (see in the green box on the right).

## How much does your PV system cost per kWp?

If you have received a quote from a PV installer simply divide your total cost by the system size in kWp. Please make sure to include or exclude sales tax as a private individual or a company.



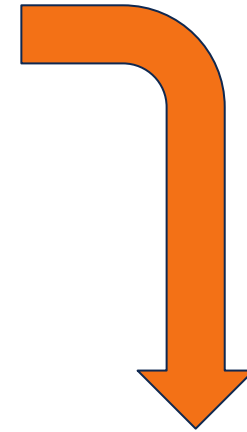
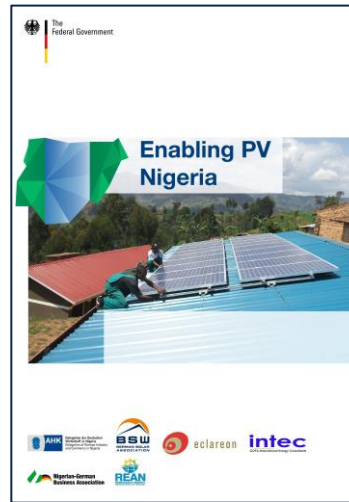
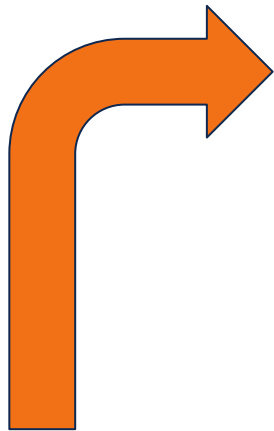
## How sunny is your location?

The solar irradiation is automatically drawn from our database based on your address input in step 1. If you wish to adjust this input based on real measurement data for your location, you can do so here.

With PV I save  
**136,7 ₦/kWh**  
 when replacing Diesel costing  
 300 ₦/l

|                           |            |
|---------------------------|------------|
| LCOE (NGN/kWh) ⓘ          | 80.11      |
| Payback Period (Years) ⓘ  | 7.16       |
| Equity IRR (%) ⓘ          | 25.8       |
| Project IRR (%) ⓘ         | 22.4       |
| Net Present Value (NGN) ⓘ | 31.821.509 |

# About the interaction of three PV market development projects in Nigeria

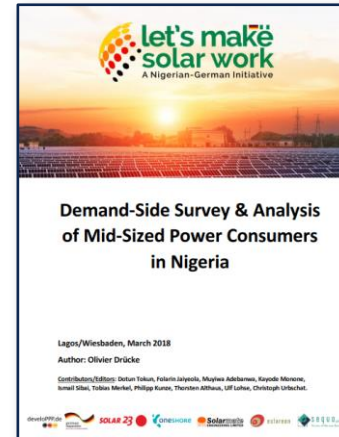


**Market activation for PV diesel hybrids  
among SMEs and social facilities in Nigeria**

# Key Outputs of **Let's make solar work**



- Demand-side survey: Analysis of mid-sized power consumers in Nigeria
- Power audits & PV diesel hybrid system sizing reports for selected SMEs and social facilities
- 5-days curriculum for ToT and EPC trainings on power audits and PV diesel hybrid systems
- Activation of supply-side EPCs to serve SMEs and social facilities:
  - [www.letsmakesolarwork.com](http://www.letsmakesolarwork.com)
  - Direct marketing & Social media
  - Press work & own Video materials



# Free Webinar: REAN presents the online portal

- 27 November, 14:00 - 15:30
- Presentation of the website and planned activities for 2019 by the partners of the info portal
- Free registration at:  
<https://attendee.gotowebinar.com/register/5978930221885943565>



Tue, Nov 27, 2018 2:00 PM - 3:30 PM CET

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Register

**Thank you for your attention...**



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