



Federal Ministry  
for Economic Affairs  
and Climate Action



MITTELSTAND  
**GLOBAL**  
ENERGY SOLUTIONS  
MADE IN GERMANY

# Activities of Project Development Programme (PDP) in Bangladesh

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Project Development Programme (PDP)

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

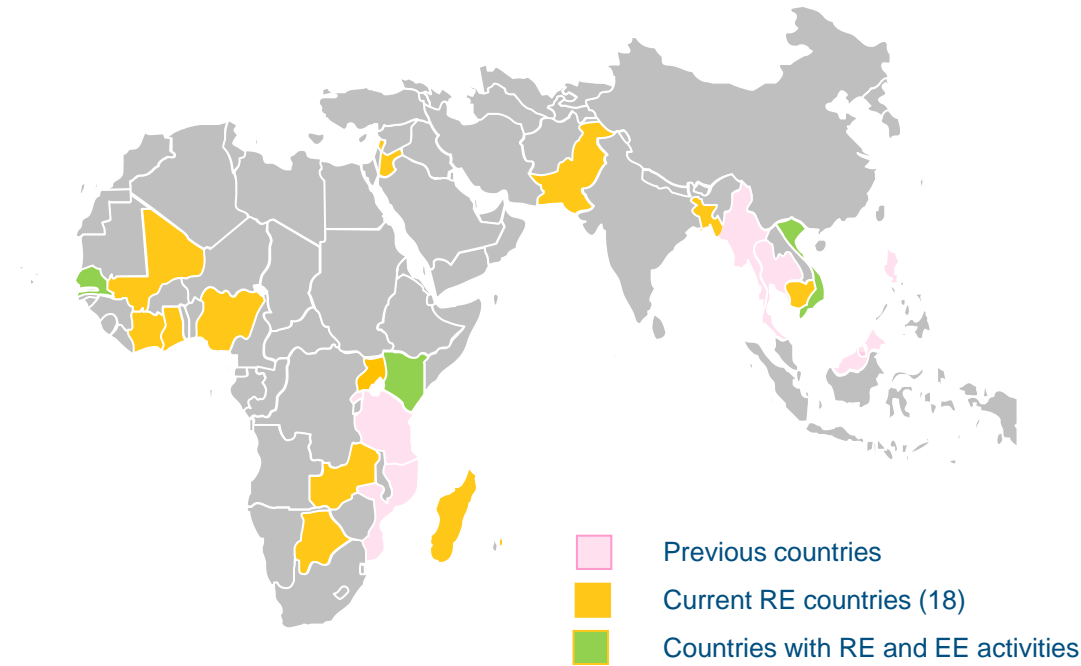
Bangladesh

Facilitator

**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH

# Project Development Programme (PDP)

Implemented by GIZ, a public company owned by German Government



## Support:

- Local industries to gain knowledge on renewable energy
- Rooftop solar feasibility study (project development)
- Selecting suitable contractors (project realization)

## 18 countries

### – Sub-Saharan Africa

- Kenya
- Ghana
- Nigeria
- Mali
- Senegal
- Côte d'Ivoire
- Botswana
- Zambia
- Mauritius
- Madagascar
- Uganda
- Rwanda

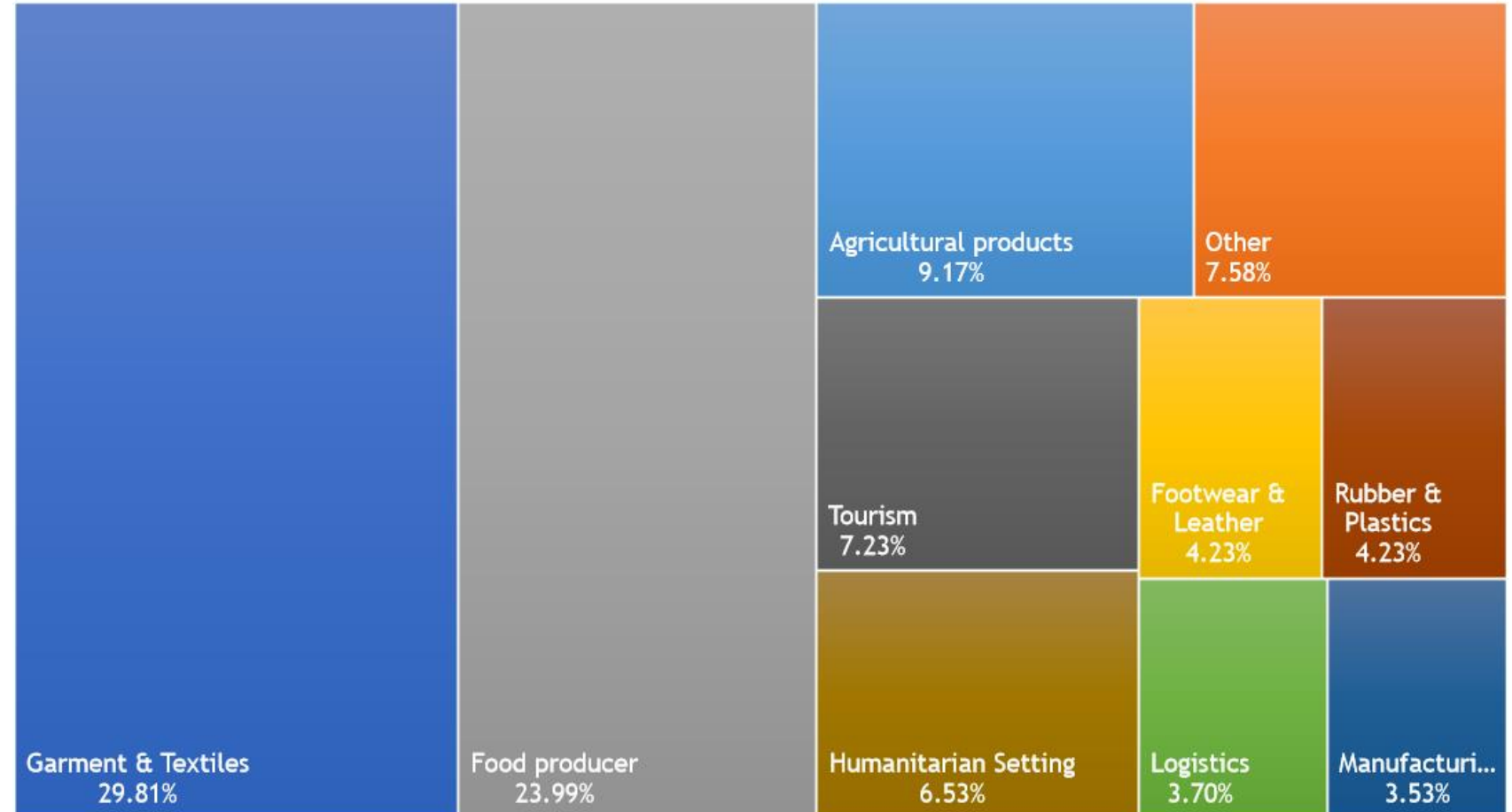
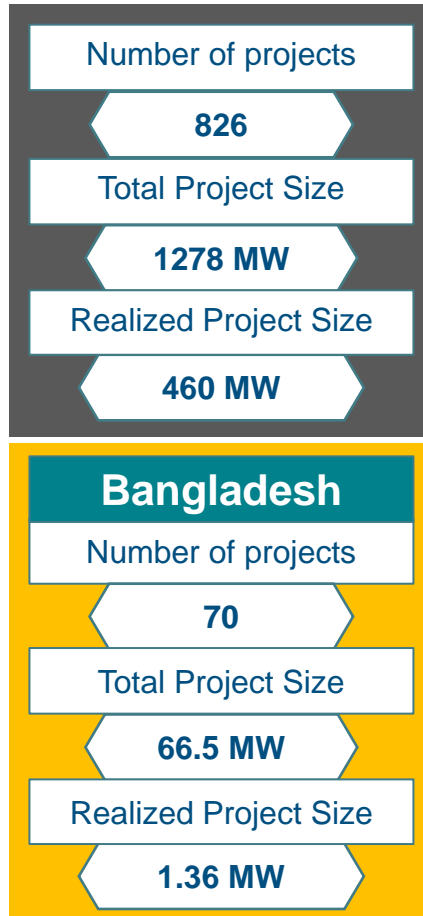
### – Middle-East

- Lebanon
- Jordan

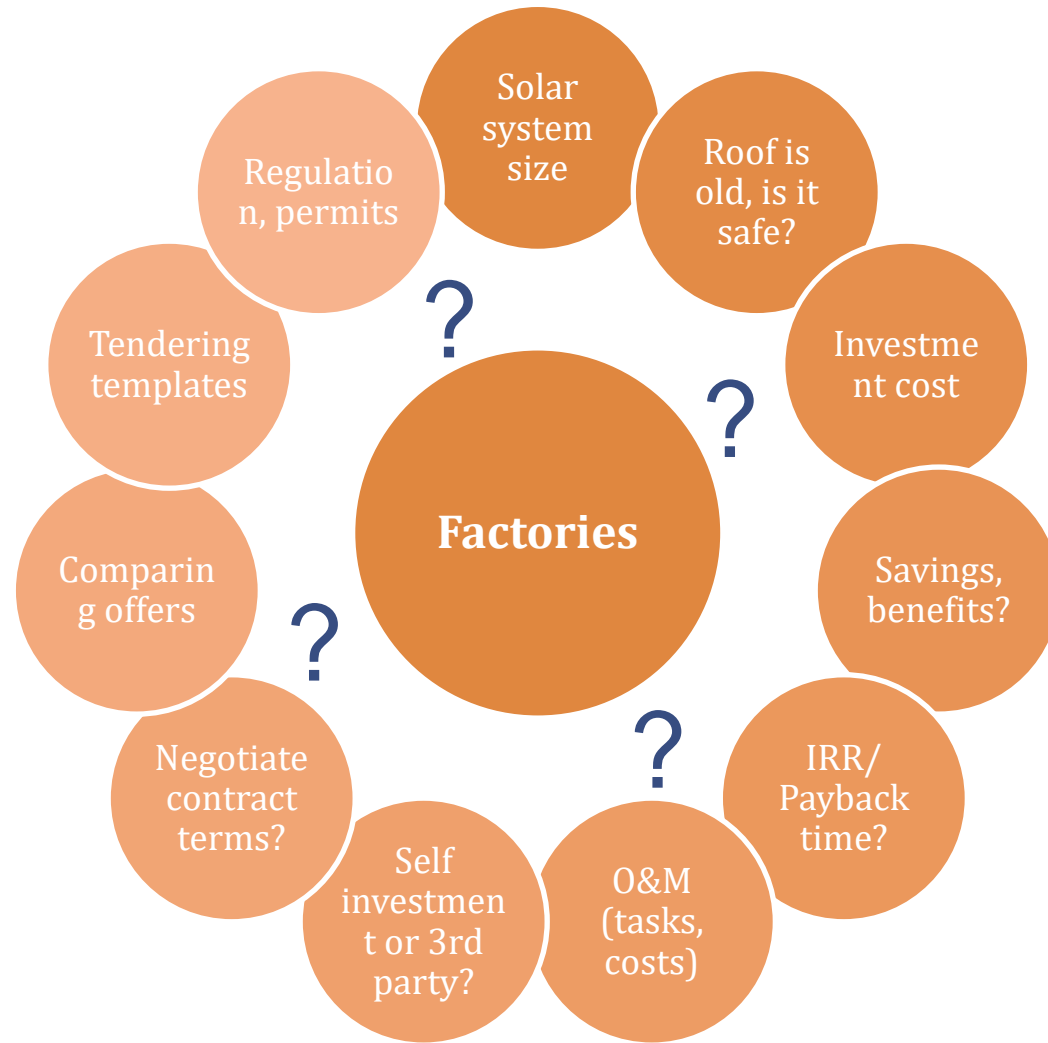
### – Asia

- Pakistan
- **Bangladesh**
- Vietnam
- Cambodia

# PDP experience supporting industries in rooftop solar application



# Where to start? Where to find reliable information?



## PDP

Funded by the German Government → neutral and transparent!

Ask us any question any time!

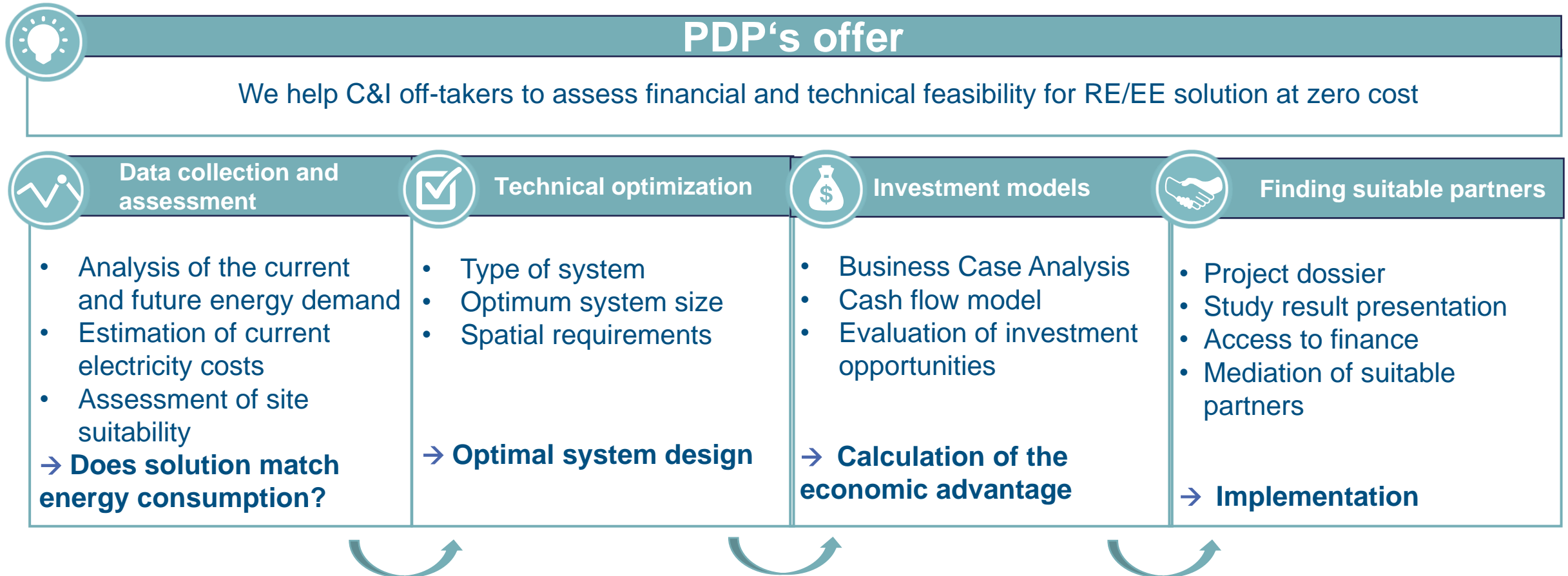
More than 10+ years experience with in-house capacity!

PDP accompany the progress at your pace!

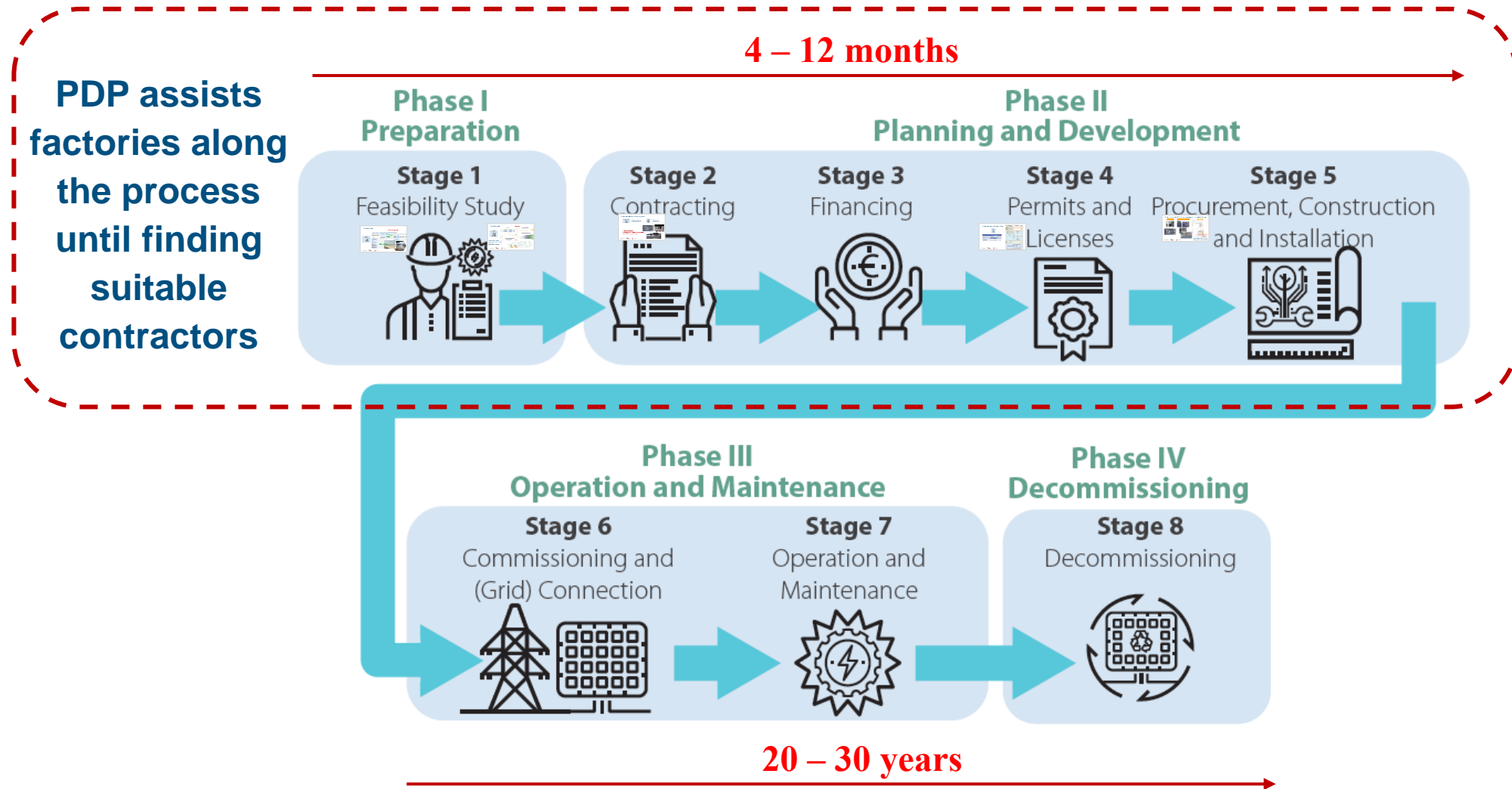
Reliable and reputable contacts!

We have strong network in the energy sector.

# Project Development Process for C&I off-takers



# Life-cycle of a rooftop solar project



# Feasibility study

## Input from factories



Stage 1

Feasibility Study



Month	Year	month	GenSet 1			GenSet 2			GenSet 3		
			Information from the GenSet Name Plate								
			Type of generator (SEG a catalogue purchase)	Energy data		Shifts per day		select No.	Shift 1:	Shift 2:	Shift 3:
Jan	2020					starts at					
Feb	2020			ends at							
Mar	2020		Rated capacity [kW]			official breaks			Break 1:	Break 2:	Break 3:
Apr	2020					starts at					
May	2020		Manufacturing Year [YYYY]			ends at					
Building / Building complex							staff using the break [%]				
available Area											
In which year the buildings were built/ roofs were replaced?											
Roof material?											
Any device, accessories currently installed on the roof?											
Allowed additional load on the roof (kg/m²)? Rule of Thumb: 25 kg/m² are the minimum static load reserve for a PV Rooftop installation											

Roof data





# Feasibility study

# Outputs

Stage 1

Feasibility Study

- Solar system: size, generation
- CAPEX, O&M, payback time, IRR, cashflows, etc.
- Benefit: savings, CO2 reduction





# Advice on tendering/ contracting process

Procurement, Construction  
and Installation



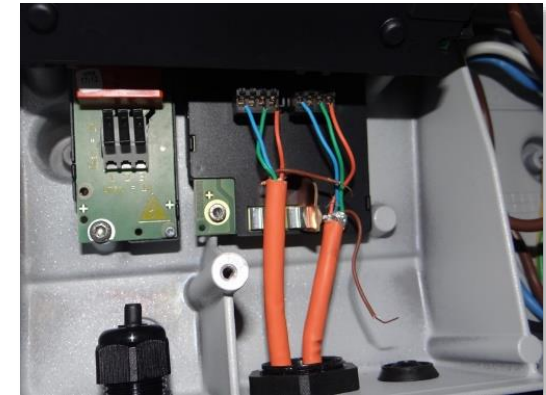
- Quotation request, tendering
- Evaluating & comparing offers
- Recommendations for solar companies

Contracting



- Crucial terms
- Contract templates
- Liability & Penalty

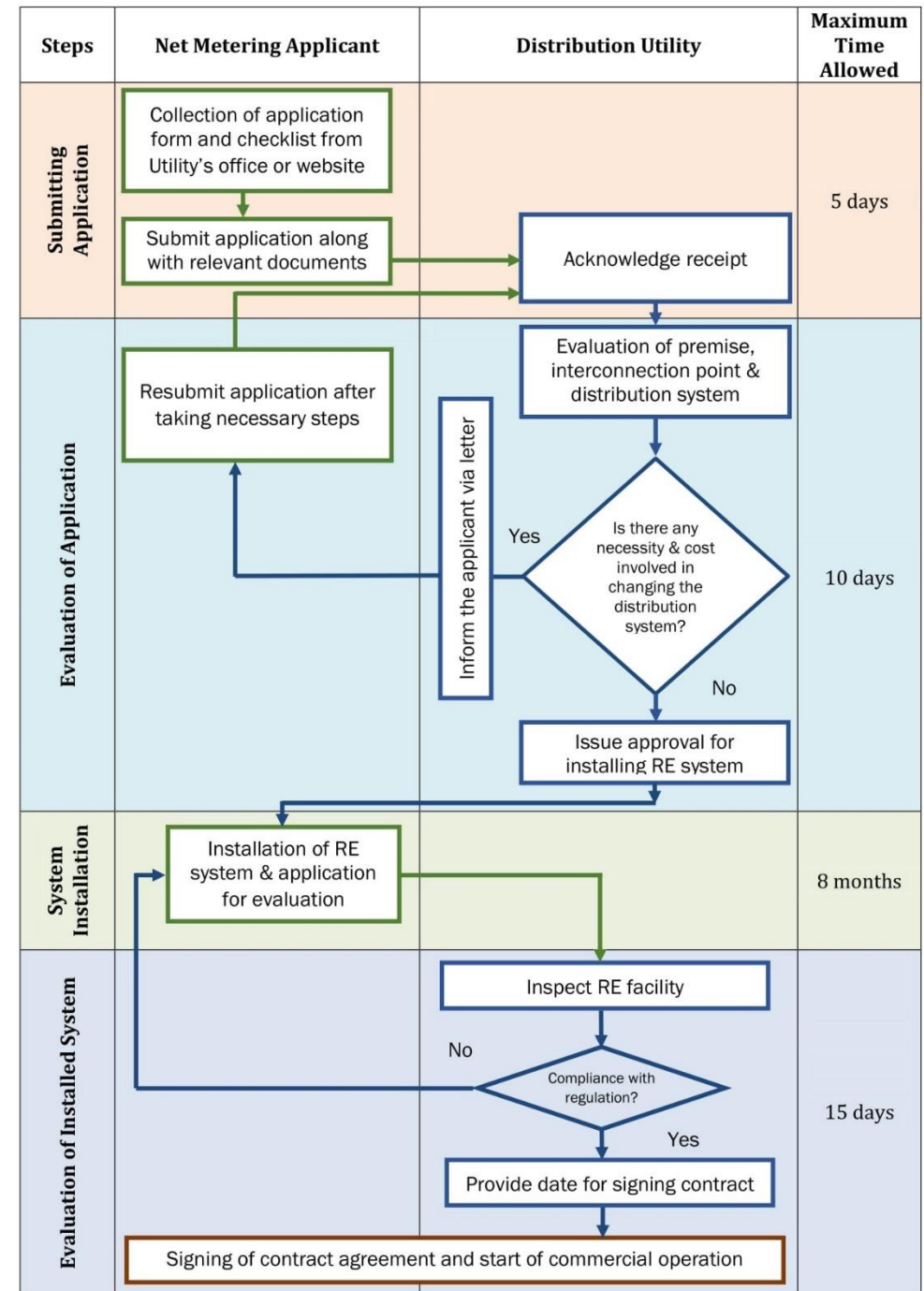
- **There is no unique solution**
- **Understanding details of each offer to find the right solution**
- **Compare all costs and benefits over 20 years**



# Advice on regulations & permitting



	Net-metering regulation
Size limit	<ul style="list-style-type: none"> <li>10 MW or</li> <li>70% of contract load can be connected to the grid</li> </ul>
Net-metering	<ul style="list-style-type: none"> <li>0.045 - 0.06 USD/kWh for net surplus at year-end</li> </ul>



# Quality issues: solar PV is not a consumer product but an infrastructure

## Equipment quality



## Solar contractor experience



## Financial loss

### Top 20 technical failures

INV	ERROR MESSAGE	€ 0.17
MOD	POTENTIAL INDUCED DEGRADATION	€ 0.21
CONN/DIST BOX	MAIN SWITCH OPEN & DOES NOT RECLOSE AUTOMATICALLY	€ 0.22
MOD	GLASS BREAKAGE	€ 0.27
STRU CT	TRACKER FAILURE	€ 0.31
MOD	BROKEN MODULE	€ 0.34
CAB	<b>WRONG/ABSENT CABLES</b>	<b>€ 0.36</b>
MOD	IMPROPER INSTALLATION	€ 0.45
INV	BURNT SUPPLY CABLE OR SOCKET	€ 0.60
TX/MV/HV	BROKEN TRANSFORMER	€ 0.66
INV	INVERTER NOT OPERATING/FAILURE AFTER GRID FAULT	€ 0.67
MOD	SHADING	€ 0.68
CAB	<b>DAMAGED CABLE</b>	<b>€ 0.69</b>
CAB	<b>IMPROPER INSTALLATION</b>	<b>€ 0.69</b>
TX/MV/HV	IMPROPER/INADEQUATE INSTALLATION	€ 0.71
MOD	SOILING	€ 0.95
INV	FAN FAILURE & OVERHEATING	€ 1.17
INV	WRONG INSTALLATION	€ 1.35
CAB	<b>BROKEN/BURNT CONNECTORS</b>	<b>€ 2.67</b>
CAB	<b>WRONG/ABSENT CABLE CONNECTION</b>	<b>€ 3.93</b>

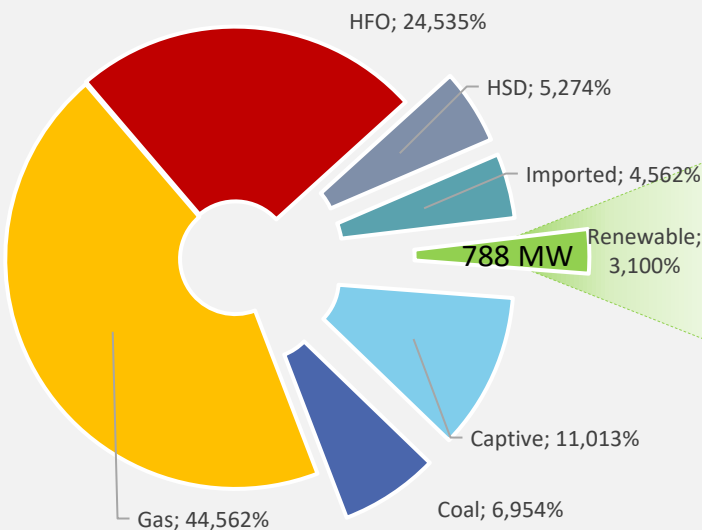
€ /kWp/year loss due to the failure

- Any component failure results in financial loss
- Every detail counts for the project sustainability

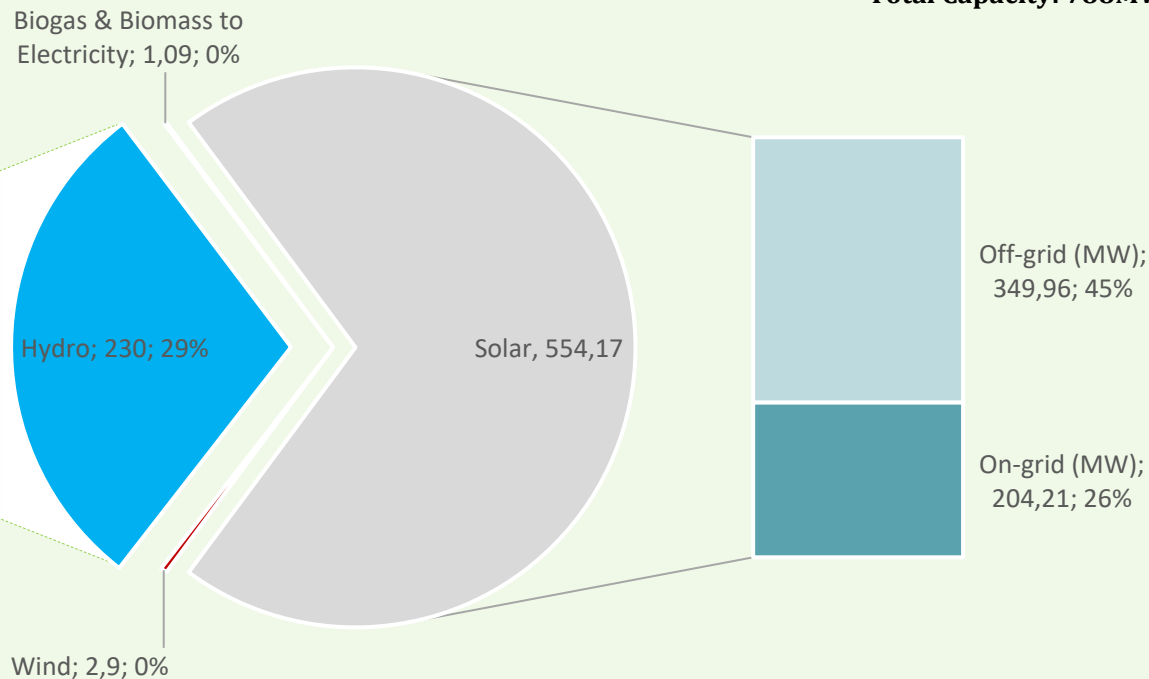
# Why Rooftop Solar in Bangladesh?

# Energy mix and Renewable energy portfolio in Bangladesh

**Electricity Generation Mix**  
Total Generation Capacity: 25,425 MW



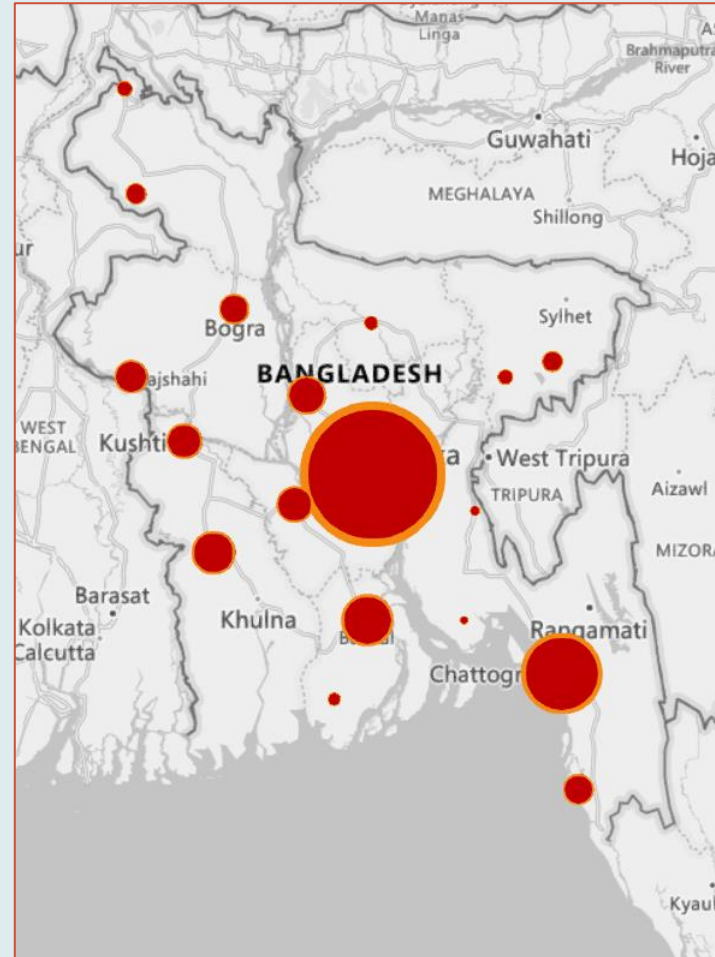
**RE Portfolio**  
Total Capacity: 788MW



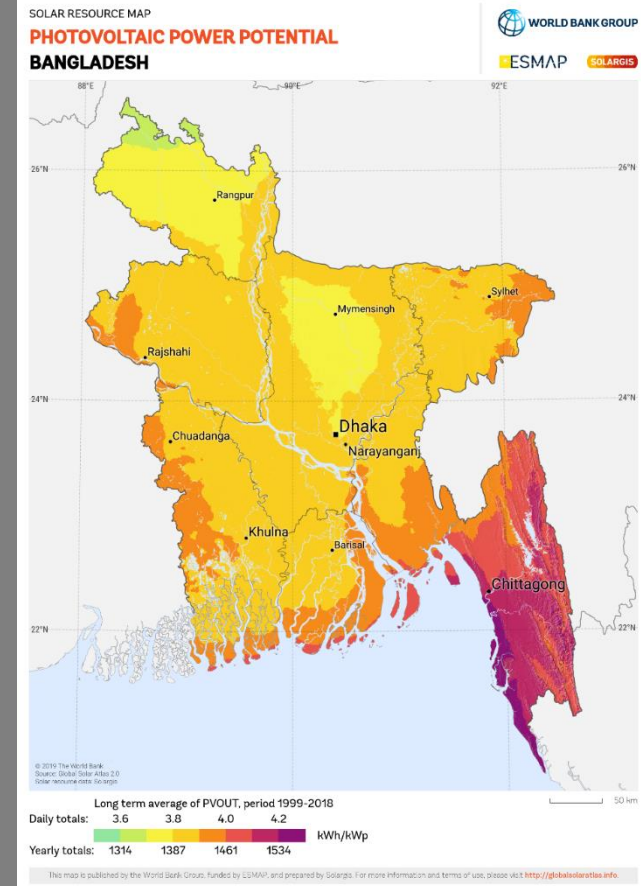


# Rooftop solar status in Bangladesh

- **1,598** systems have been installed under NEM with total capacity **42.194 MWp**
- Most systems are smaller than 1,000 kWp

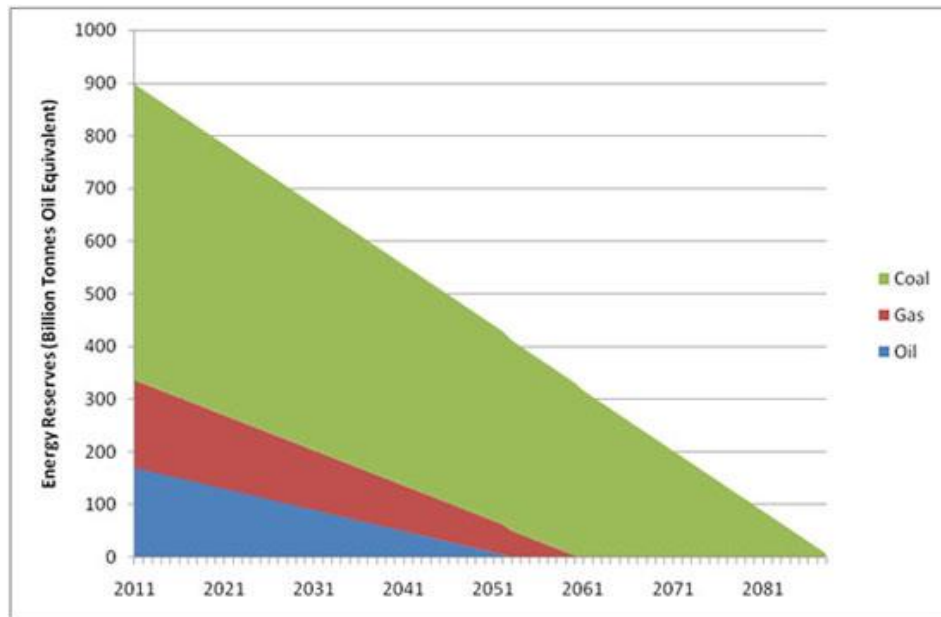


Annual yield 1,314 – 1,534 kWh/kWp

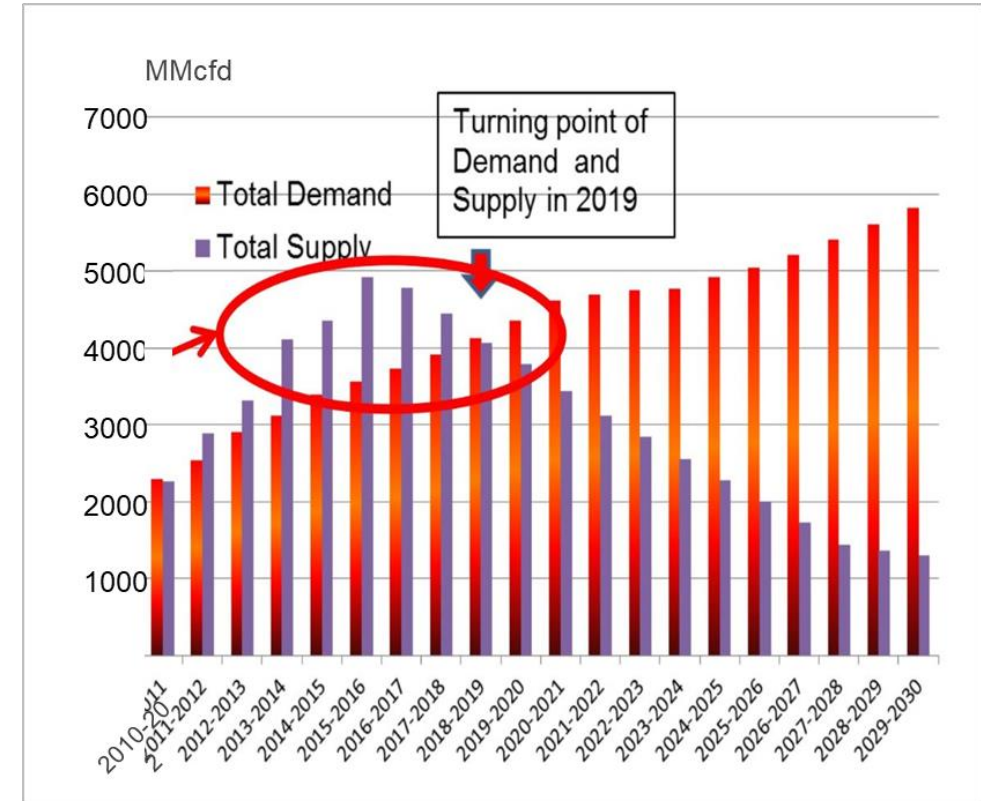


# Why Rooftop Solar in Bangladesh?

## Existing conventional sources



- Fossil fuels depleting and becoming expensive

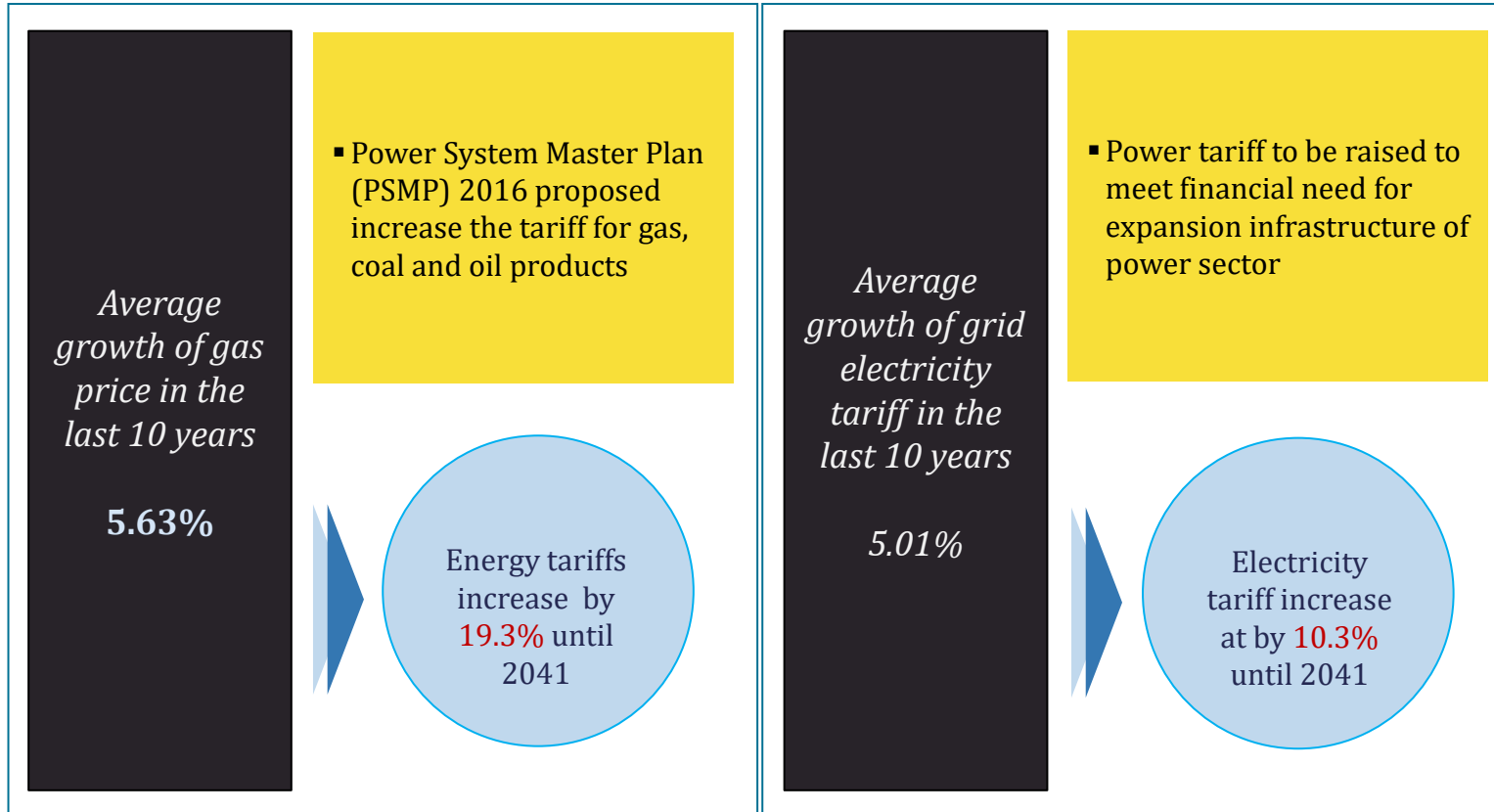


- Domestic gas reserve is depleting → import
- LNG price increases steeply in Bangladesh



# Why Rooftop Solar in Bangladesh?

## Cost development of conventional sources

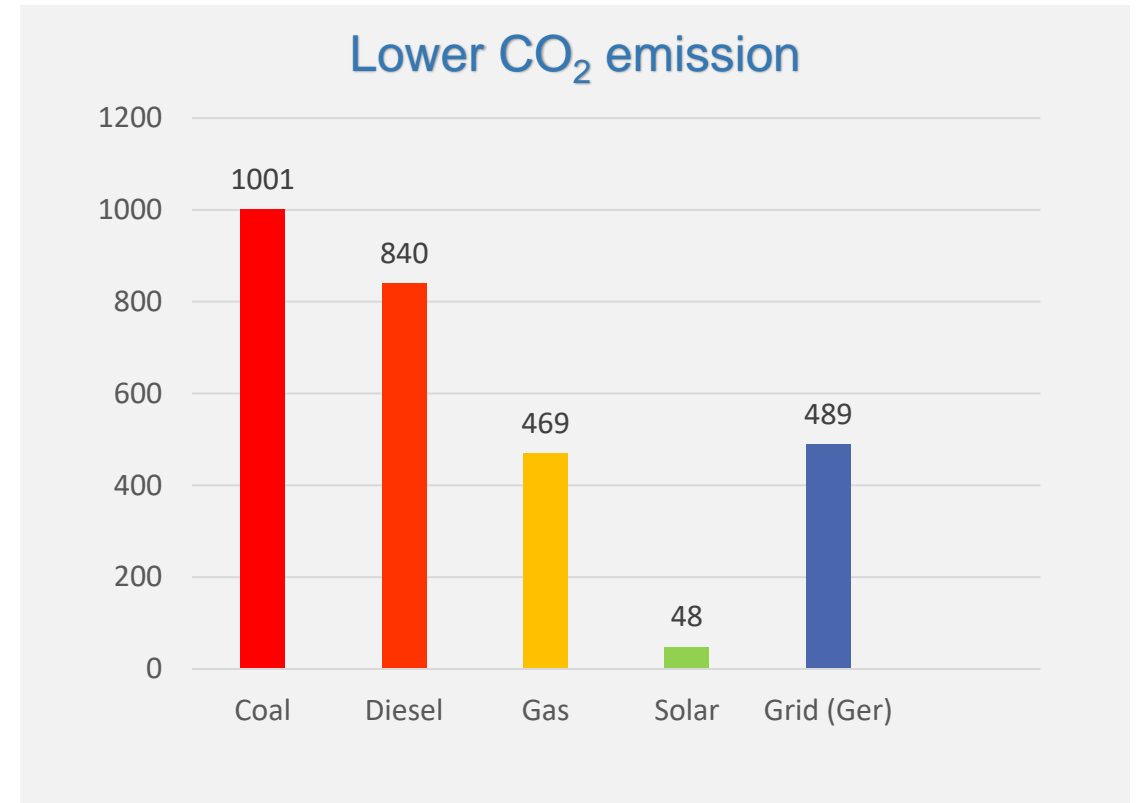


- ❑ In practice, LNG price increased 15% (2017) and 38% (2019)
- ❑ BERC recommends 57.83% hike in bulk electricity price
- ❑ LNG electricity price 3-6 USD ct/kWh → more expensive than solar energy in 2-3 years
- ❑ Solar is already cheaper than grid!
- ❑ Diesel price increased by 23% in November 2021

# Why Rooftop Solar in Bangladesh?

## Climate action

- Electricity from fossil fuel has higher CO<sub>2</sub> emission than electricity from renewable energy



# Cooperation with PDP

## **Value addition opportunities:**

Neutral and comprehensive advice covers:

- Economic and technical perspective and approach
- Enhancing knowledge to enter contract negotiation

# Thank you for your attention!

## Project Development Programme (PDP)

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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