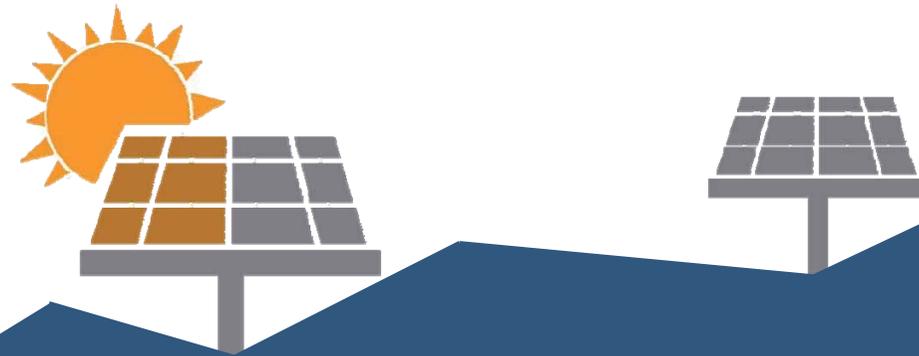




# Villa College

## Renewable Energy Initiative

### Solar Power Generation Project



# History of the project

- ➔ Villa College and PCKK began exploring the idea of installing solar power under **JCM grant in July 2014**.
- ➔ Initial idea was to establish 200kW of solar power worth **\$600,000**.
- ➔ Both institutions aim to submit a joint application by **November 2014**.
- ➔ Proposed financing was through Maldives Islamic Bank - Initial discussions were held with the bank by VC and PCKK staff
- ➔ The installation was aimed to commence in **March 2015**.



# Villa College

## Solar Power Generation Project

- ➔ Upon investigation it was determined at Villa College only **186kW** of solar panels can be installed.
  - *Project size downgraded.*
- ➔ Bank of Maldives was identified as an alternative source of finance.
- ➔ In September **2014 VC and PCKK signed joint MOU** to commence the application and project.
  - *Subsequently agreements were signed between parties.*
- ➔ **JCM approval** of the project news came in January 2015.



# Villa College

## Solar Power Generation Project

- ➔ Villa College submitted a loan application to **Bank of Maldives in March 2015.**
- ➔ Meeting with Minister for Environment was held to gather government support to get finance for the project.
  - *During the meeting Minister mentioned about the **new Green loan.***
- ➔ The Administrator of JCM Financing Programme has considered the project to be rolled to next fiscal year.
- ➔ Final agreed project size was **186.72kW.**



# Villa College

## Solar Power Generation Project

- ➔ Meeting with Bank of Maldives was held with regard to Green Loan application in **February 2016**.
- ➔ The requirement for a collateral that is **150%** of the project value was an issue.
- ➔ The Administrator of the JCM Financing Programme extended the project for **2016-2017 fiscal year** under the condition that work must be completed by January 2017.
- ➔ Bank of Maldives approved the loan on **25th October 2016**.



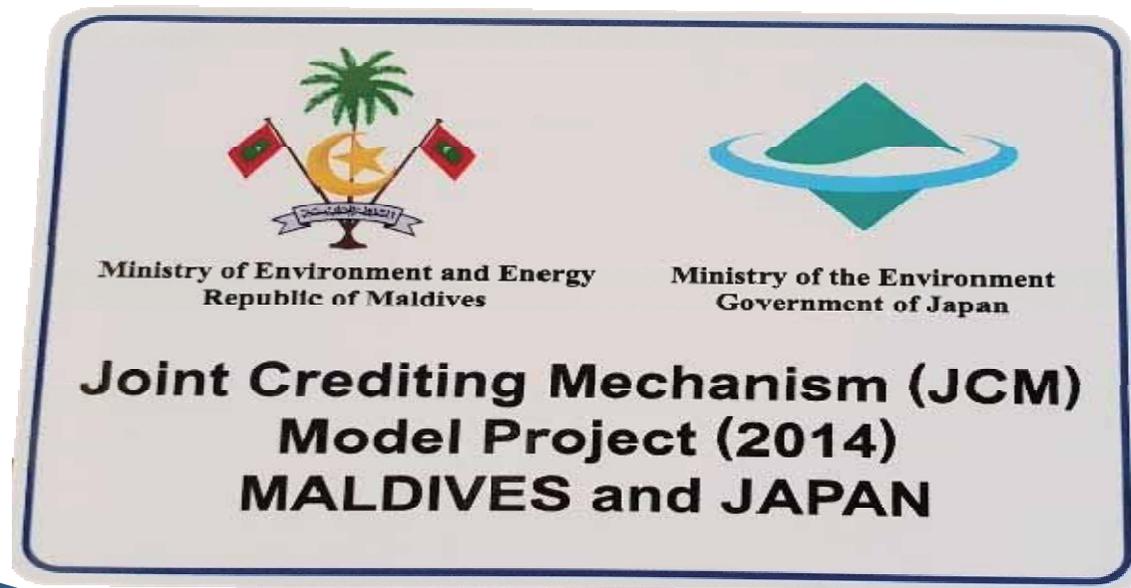
# Villa College

## Solar Power Generation Project

- ➔ Ordering of parts commenced in **end April 2017**
  - *Installation followed shortly in 2017*
  - *Installation was completed in **end September 2017***



# The 1st Net- Metering agreement The largest private investment in Capital of Maldives



# Villa College

## Solar Power Generation Project

### Major milestones



Exhaustion



# 186.72 kW Solar PV System



Solar Power Generation Project

# Inverter Room



# Inverter Room



# Financial feasibility

➔ The basis by which VC undertook financial feasibility study is as follows:

Costs	
Proposed Capacity	186Kw
investment	MVR 4,200,000.00
Benefits	
	MVR
Annual Saving In Electricity bill	MVR1,000,000
JCM Funded 50%, effective Investment Cost	MVR2,100,000

Payback is expected to be  
4 years without JCM  
With JCM funding 3 years



# How much can be saved in expenditure?

Month	Total Usage	Export to National Grid	Billed Usage	Bill Period ( days)	Bill Total	PV system reading production	Total saving	tariff highest marginal rate	Total Ssaving		
Sep-17	42354	3314	39040	36	169,248.00	10510	13824	4.35	60,134.40	2017	355,064.40
Oct-17	36231	2073	34158	30	145,977.30	24130	26203	4.35	113,983.05		
Nov-17	36457	2028	34429	35	149,206.15	16030	18058	4.35	78,552.30		
Dec-17	21010	3509	17501	27	75,697.35	20030	23539	4.35	102,394.65		
Jan-18	31955	2113	29842	30	129,332.70	20350	22463	4.35	97,714.05	2018	1,175,052.45
Feb-18	37349	2504	34845	31	151,079.75	21660	24164	4.35	105,113.40		
Mar-18	34849	2934	31915	29	138,366.25	24640	27574	4.35	119,946.90		
Apr-18	35455	1642	33813	29	146,622.55	21440	23082	4.35	100,406.70		
May-18	31190	2223	28967	30	125,526.45	18570	20793	4.35	90,449.55		
Jun-18	32146	2342	29804	31	129,151.40	18610	20952	4.35	91,141.20		
Jul-18	34664	2045	32619	29	139,369.65	18200	20245	4.35	88,065.75		
Aug-18	34660	3375	31285	32	135,577.75	20190	23565	4.35	102,507.75		
Sep-18	32926	3885	29041	30	125,848.35	20270	24155	4.35	105,074.25		
Oct-18	34592	789	33803	30	146,563.05	18680	19469	4.35	84,690.15		
Nov-18	37698	2065	35633	33	154,475.55	17500	19565	4.35	85,107.75		
Dec-18	22196	4800	17396	30	75,192.60	19300	24100	4.35	104,835.00		
	535,732.00	41,641.00	494,091.00	492.00	2,137,234.85	239,410.00	351,751.00		1,530,116.85	3,667,351.70	42%

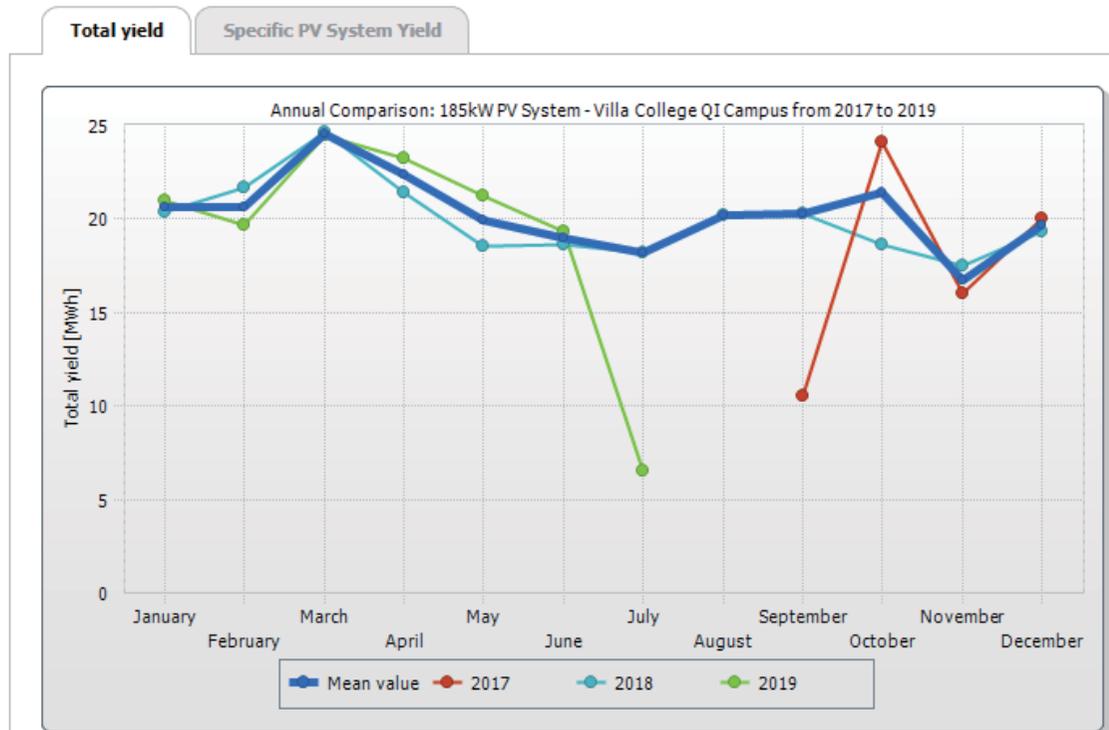
# Data from Sunny Portal

Total yield [MWh]													
	January	February	March	April	May	June	July	August	September	October	November	December	Total
2017									10.51	24.13	16.03	20.03	70.7
2018	20.35	21.66	24.64	21.44	18.57	18.61	18.2	20.19	20.27	18.68	17.5	19.3	239.41
2019	20.95	19.7	24.48	23.29	21.25	19.32	6.83						135.83
													445.94
Mean value	20.65	20.68	24.56	22.36	19.91	18.97	18.2	20.19	20.27	21.41	16.77	19.67	243.63
Year portion	8.48%	8.49%	10.08%	9.18%	8.17%	7.79%	7.47%	8.29%	8.32%	8.79%	6.88%	8.07%	100



# Data from Sunny Portal

Annual Comparison | 185kW PV System - Villa College QI Campus



# CO<sub>2</sub> Avoided

As per JCM's Monitoring, Reporting and Verification (MRV) activity – Villa College has avoided approximately **190 tonnes of Carbon dioxide until 22 February 2019**



# Challenges we faced

- ➔ There is very limited opportunity in the Maldives to finance such projects through Bank loans –**high Interest rate**
- ➔ The **collateral (150%)** on these loans make it impossible for small business to undertake such projects relating to renewable energy.
- ➔ The structure of JCM project requires a lot of finance to be committed before the spending is reimbursed.



# BML Green Loan

## BML Green Loan

BML Green Loan is targeted for individuals and businesses looking to invest and promote the use of green technology and resources. Eligible individuals or businesses have the opportunity of obtaining a loan value of up to MVR 20 million.



### Key Features

- No deposit required
- No arrangement fee
- Low equity contribution of 15% with BML financing the remaining 85%
- Loan amount from MVR 50,000 to MVR 20 million
- Interest rate of 11% (Base rate + 1%)
- Repayment period of 20 years



# Challenges we faced

- ➔ One of bases of our saving in the financial feasibility comes from benefits of net metering arrangement from the State electronic provider.
  - *A legislation on net metering exists in the Maldives.*
  - *The state electricity provider (STELCO) was hesitant to facilitate a net metering arrangement*
  - *VC negotiated with STELCO and we were the first in the Maldives to conclude a successful net metering agreement to benefit from solar power use.*



# Indirect benefit to supply chain

- ➔ The JCM technical supervision in **MRV** and scrutiny makes suppliers responsible to make everything to be up to the standard set out in the internal standards expected and have an efficient delivery system in place.
  - *Suppliers needed to raise to the occasion to ensure job is successful*
  - *Suppliers had to find their internal lapses and correct them to pass the supervision and scrutiny.*
  - *This was a huge learning experience for them.*



# What is next?

## Villa Shipping and Trading Company plans to invest:

- ➔ In 2019 in **Solar power generation projects** in two of their properties, **Adh. Maamigili Island**
- ➔ **Maandhoo Fisheries Complex** which include **1.4 Mega watt** grid with a estimate investment of **USD2million**.
- ➔ VC has **7 campuses** across the Maldives and have plenty of roof space. It is only feasible if we could share the excess and set off against QI Campus, Male'.. Sharing excess Solar power generations between 2 grids ( STELCO and Fenaka)



# Our gratitude

- ➔ We thank Global Environment Centre Foundation, **the Administrator of JCM Financing Programme** for being flexible to roll the project until the finance issue has been resolved.
- ➔ We thank **Ministry of Environment** for their role in facilitating a JCM Project In the Maldives.
- ➔ We thank **PCKK** for guiding and pushing us to get the project completed.









***Thank You***

