

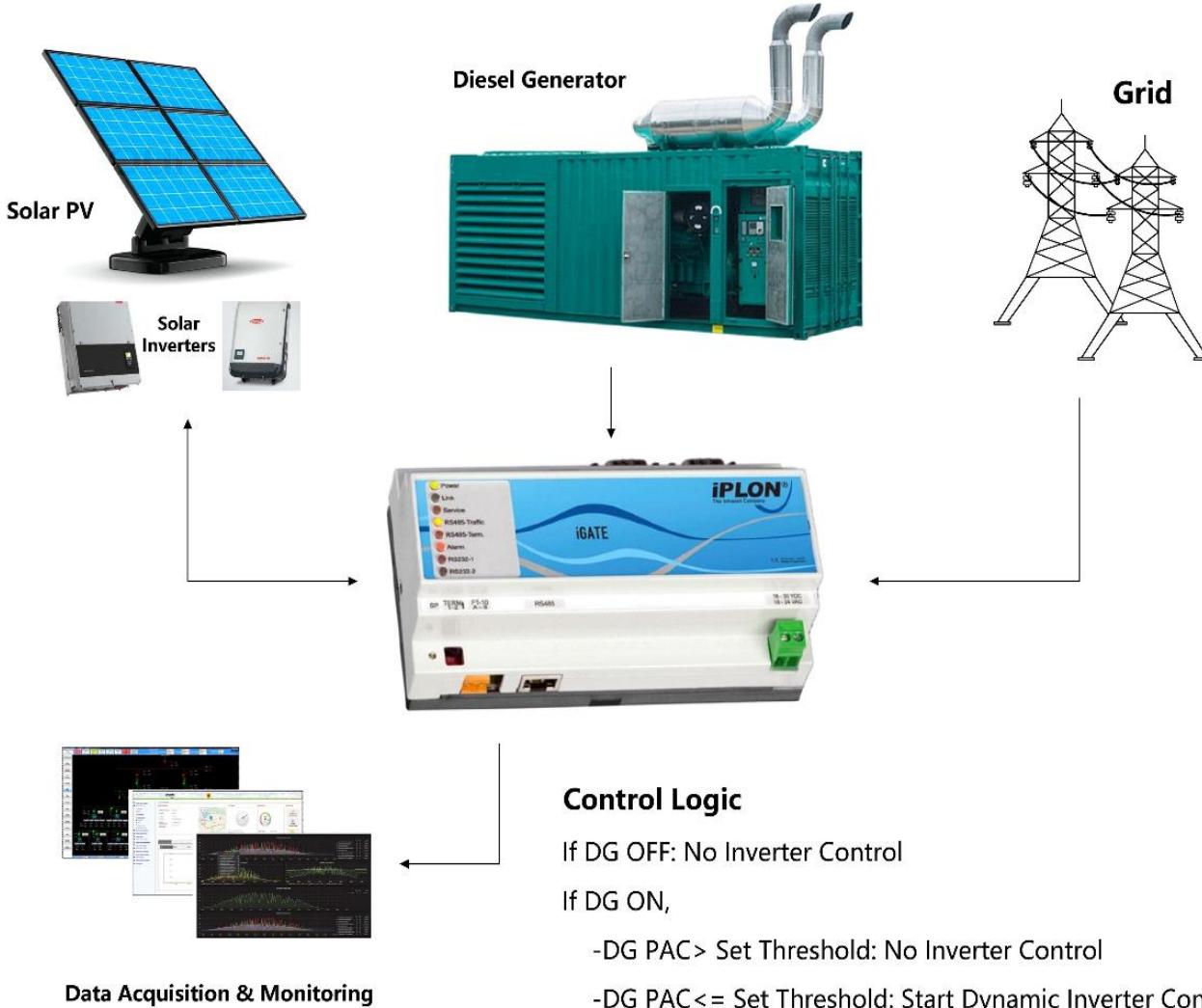
Micro Grid Solutions

Case Study & PV-DG Live Demo

**Sreenath & Rahul
iPLON India Pvt Ltd
#26/80,Luz Avenue, 5th Street, Mylapore,
Chennai, Tamil Nadu, India 600 004**



PV-DG Fuel Saver Controller



PV-DG Controller does

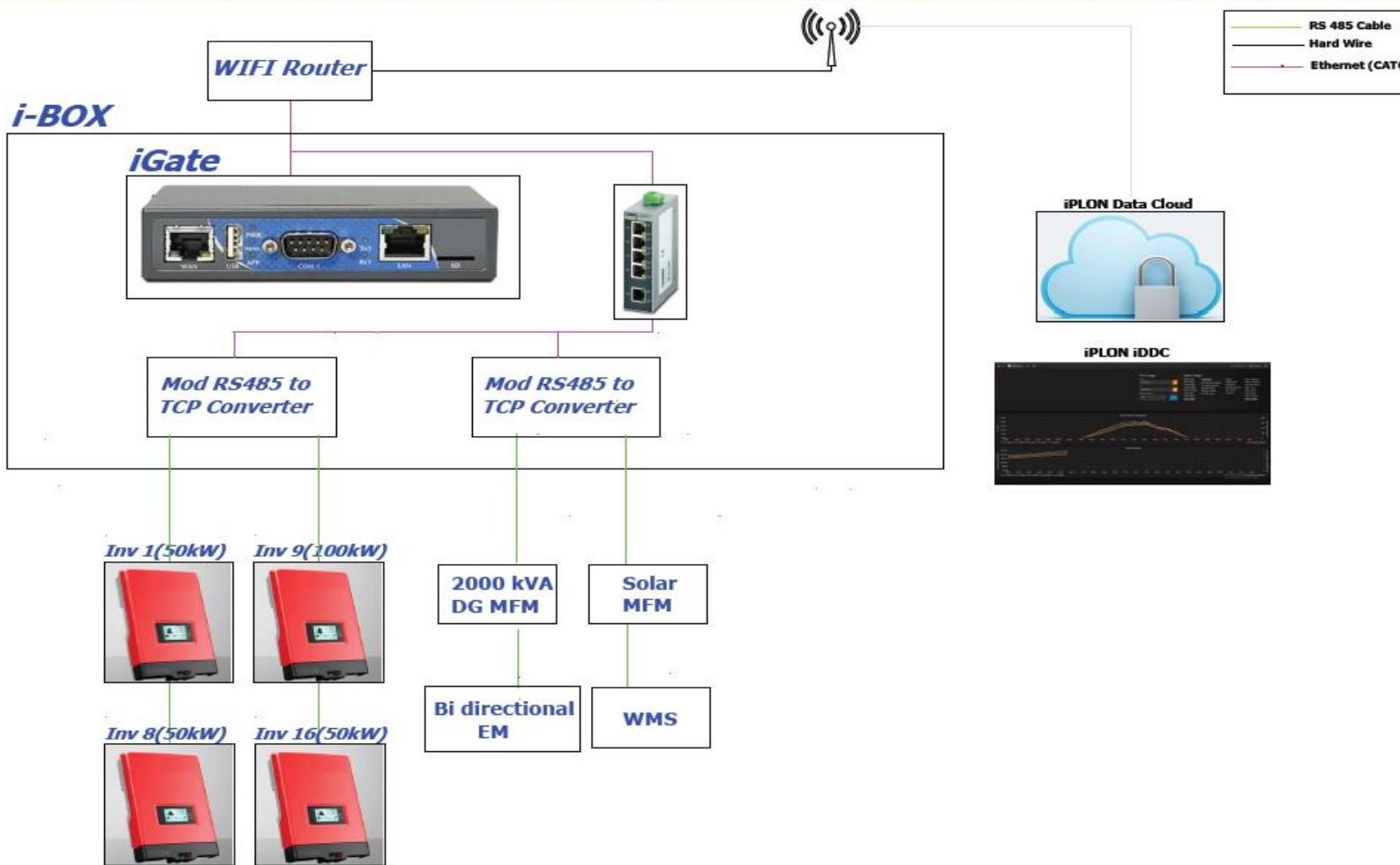
- Inverter output control
- Protection against reverse current
- Maintains the DG in the safe operating efficiency
- Fully automated system operation



How it Works



Plant Communication Architectural Diagram



PLANT Details

PV Capacity - 800 kW (16 INV)

DG Capacity - 2000 kVA

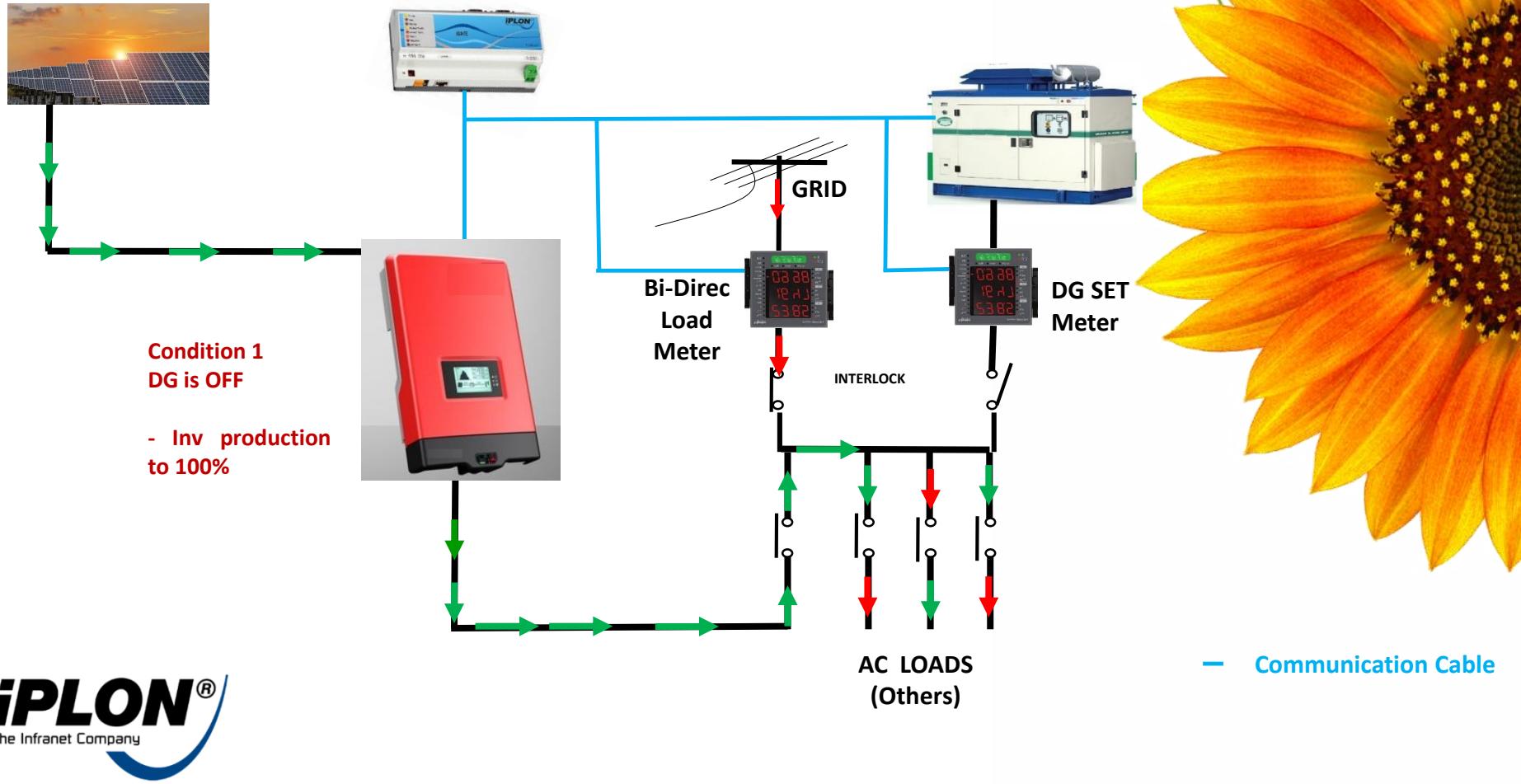
DG_MIN_LOAD – 30% of 2000kVA (600 kW)

DG_CRITI_LOAD – 10% of 2000kVA (200 kW)

PV_POW_LIMIT 0 % - 100%



PV-DG Hybrid Power System

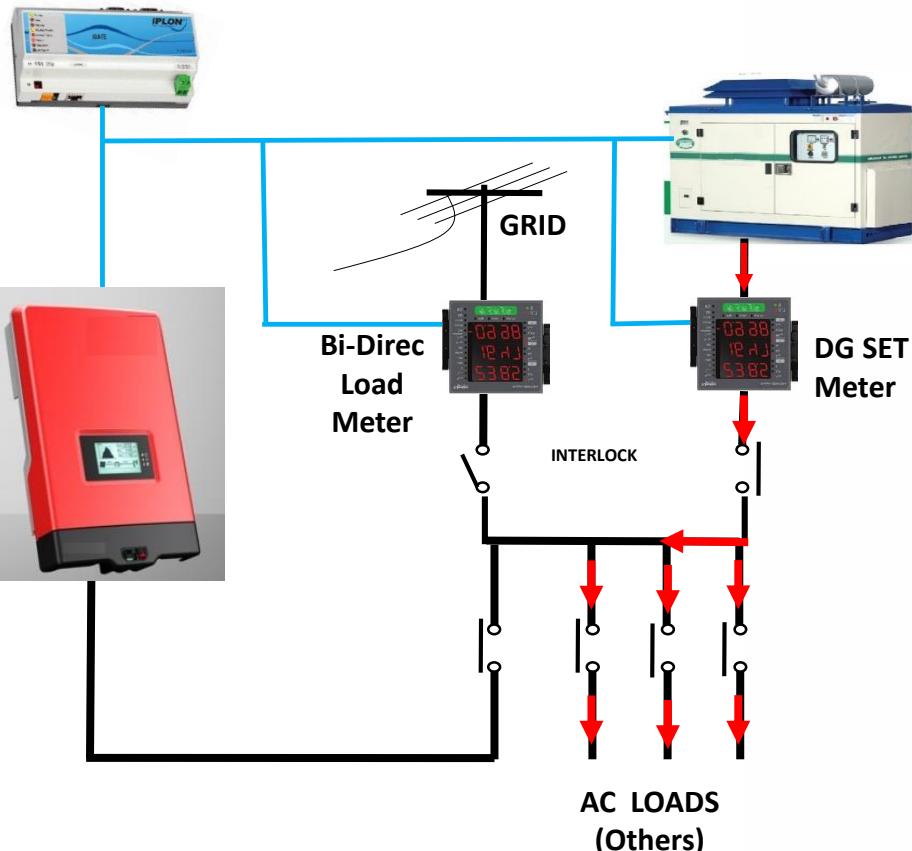


PV-DG Hybrid Power System

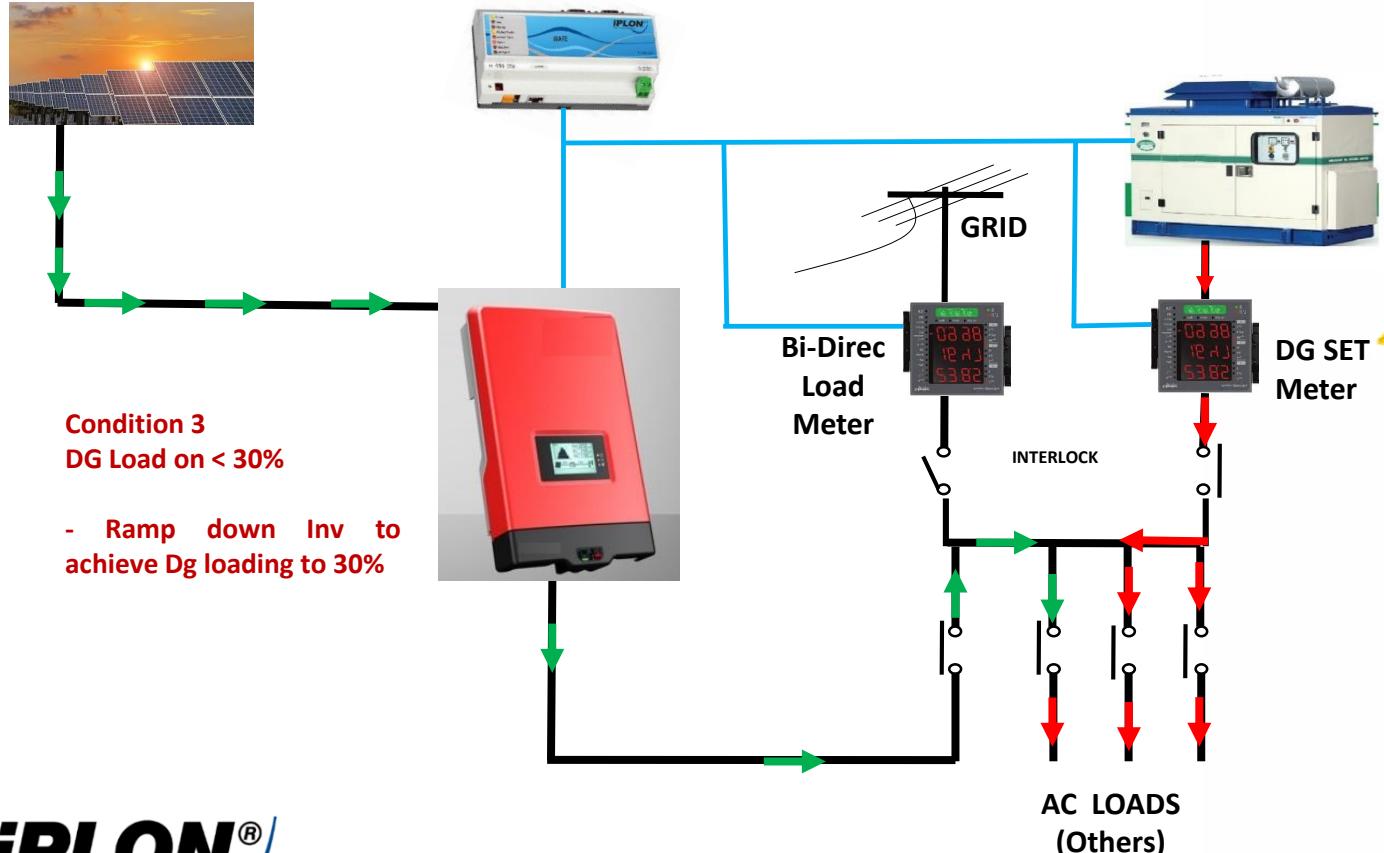


Condition 2
DG Consumes 10% of load

- Inv production to 0%

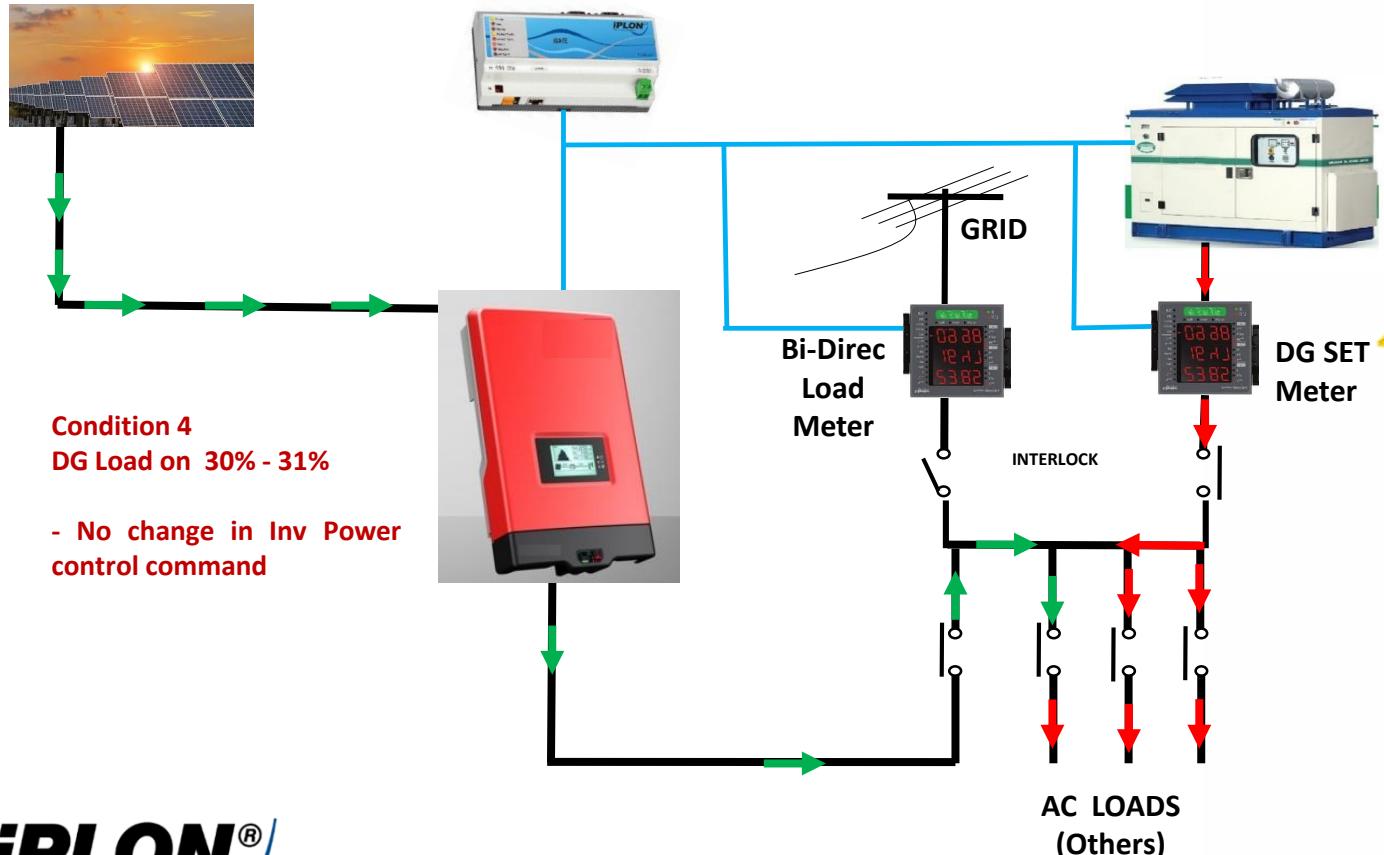


PV-DG Hybrid Power System



iPLON®
The Infranet Company

PV-DG Solar Power System

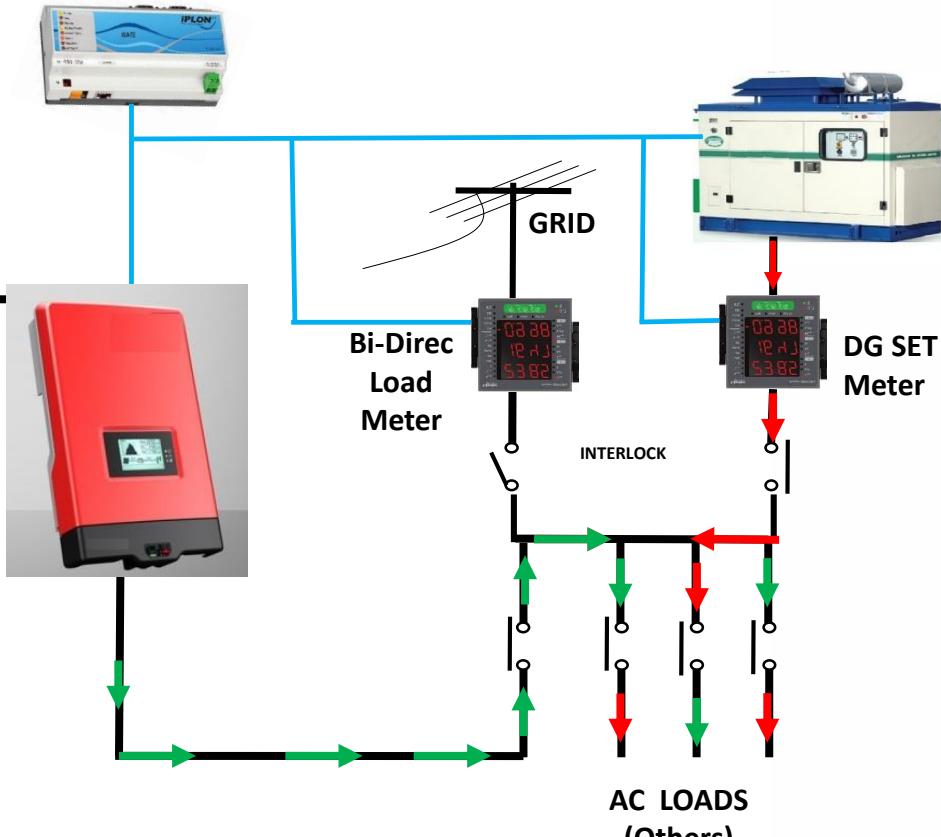


PV-DG Hybrid Power System



Condition # 5
DG Load in > 31%

- Ramp up Inv to achieve
DG loading to 30%



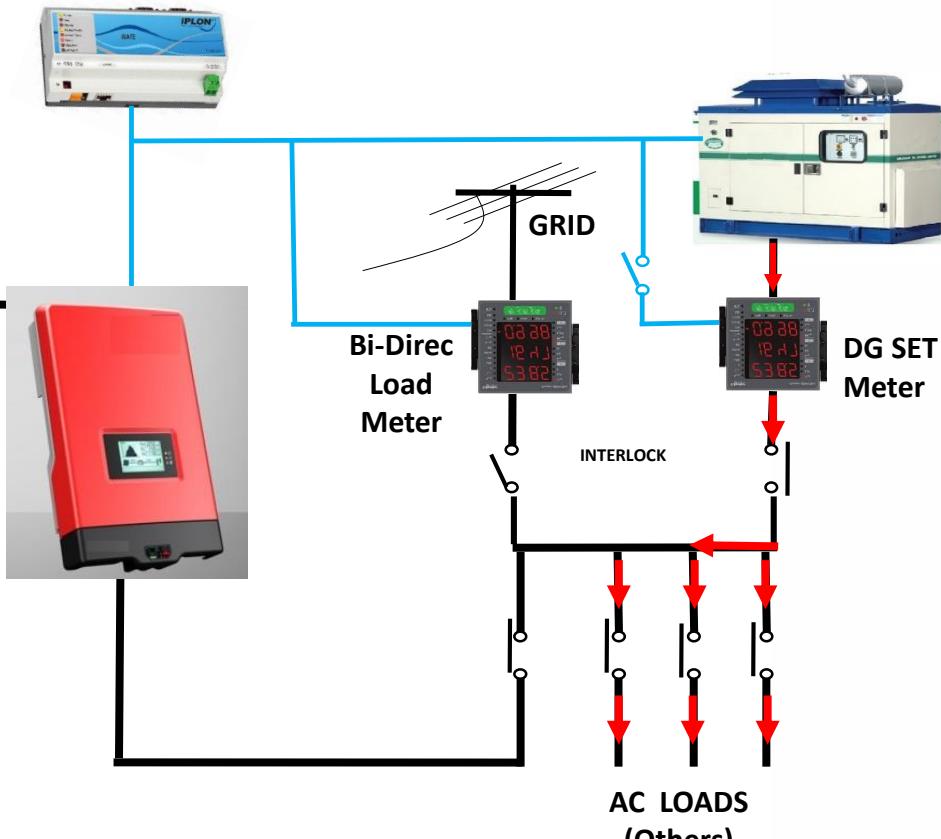
PV-DG Hybrid Power System



Communication Open

Fail Safe Logic:

If Feedback meters comm.
breaks – Inv to 0%



iPLON®
The Infranet Company

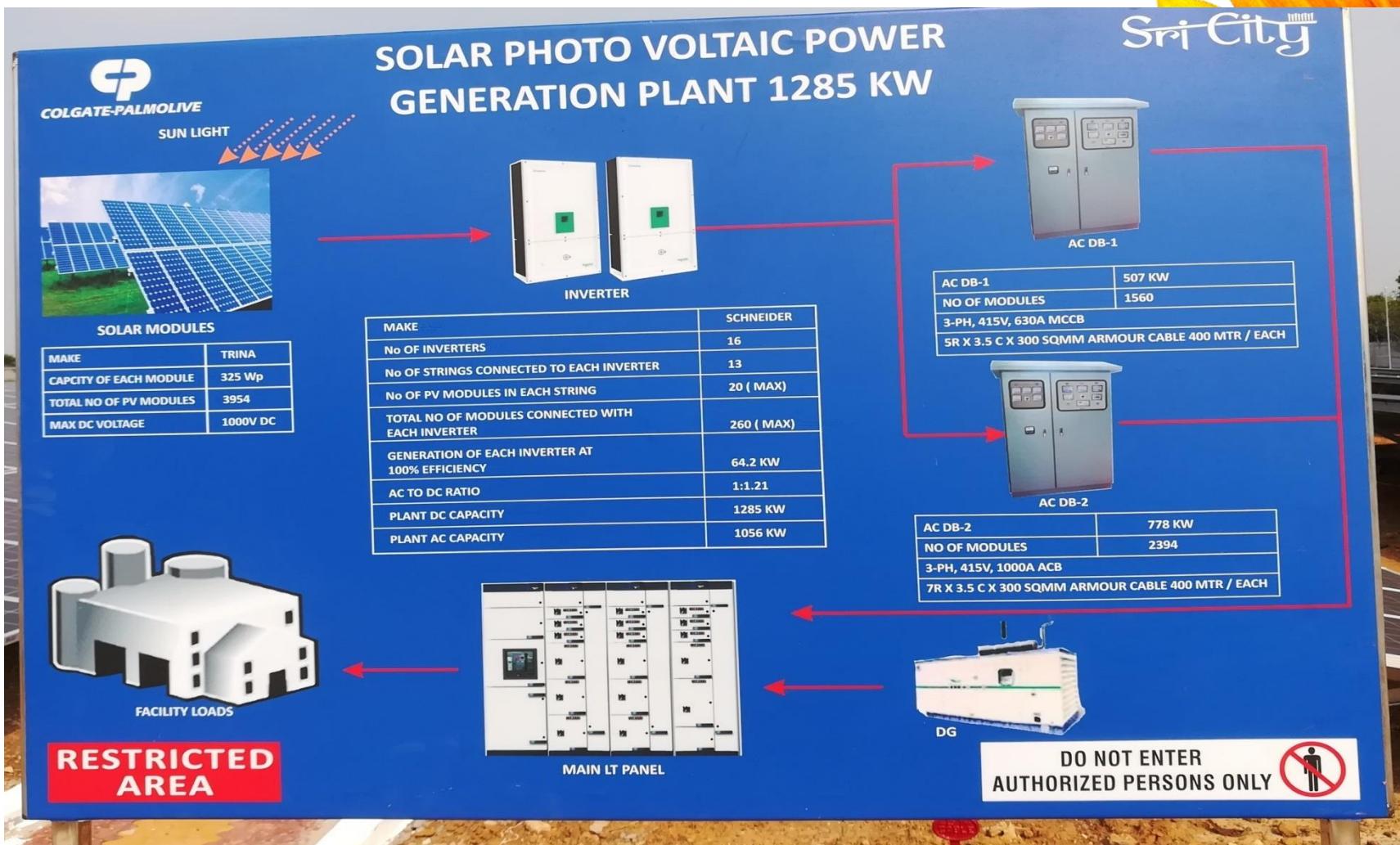
PV-DG Controller Installed Sites



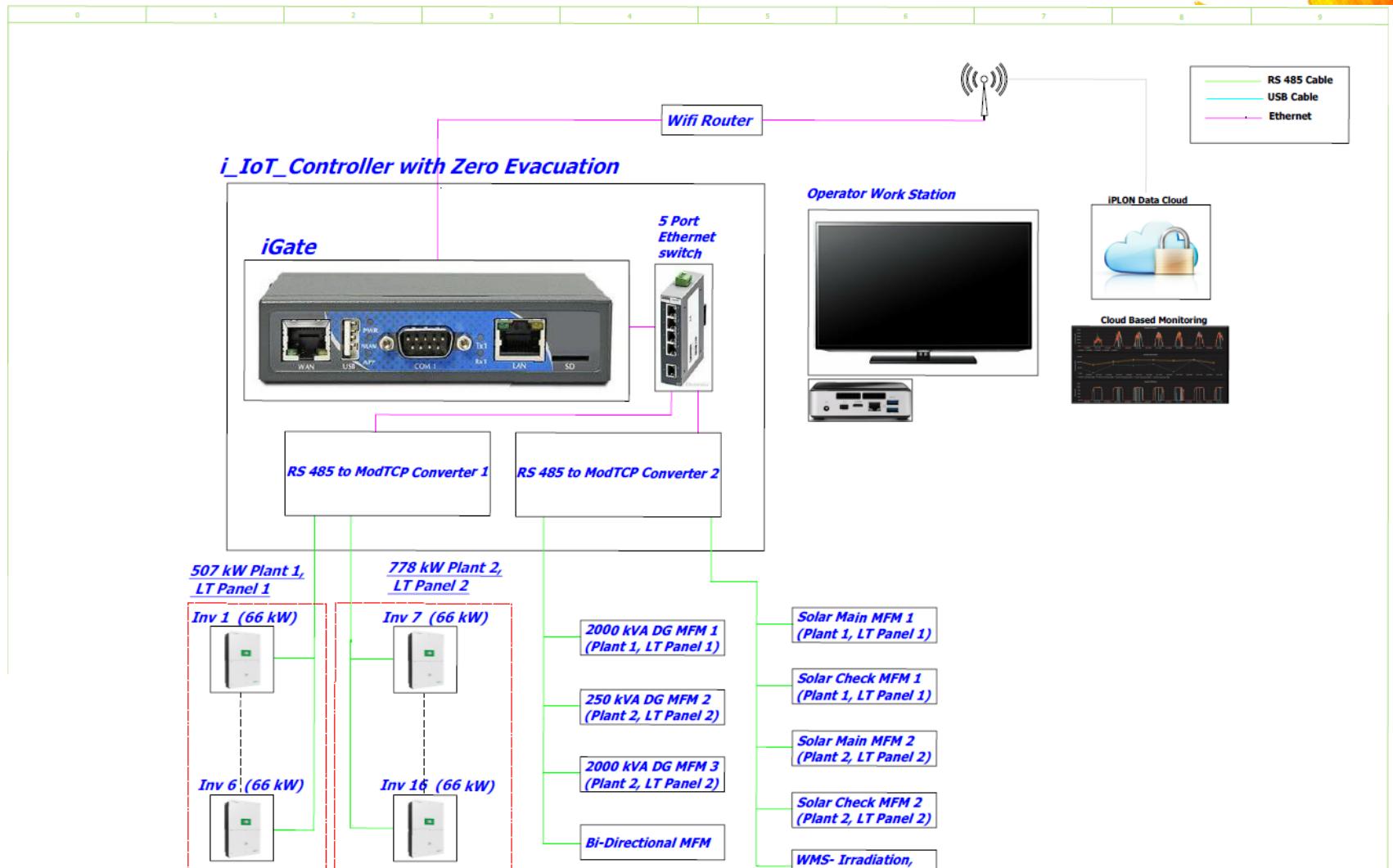
Colgate plant Sricity, Plant Layout.



Colgate Plant Description.



Colgate Plant Communication Architectural Diagram



+INH/1.e

Draft		Datum	29.08.2018	1.2 MW PV-DG+ZE, SriCity	iPLON GmbH Karl-Kurz-Strasse 36, 74523 Schwäbisch Hall
Bearb.				Thermax	
Gepr.					
Aenderung	Datum	Name	Urspr.	Ersetzt durch	Ersetzt durch

Architecture Single Line Diagram

Please note indicative but not actual

=
+

Drawing 1001

Blatt 1
Blatt 1

1.1

Inverter's @ site



2 * 2000 kVA DG



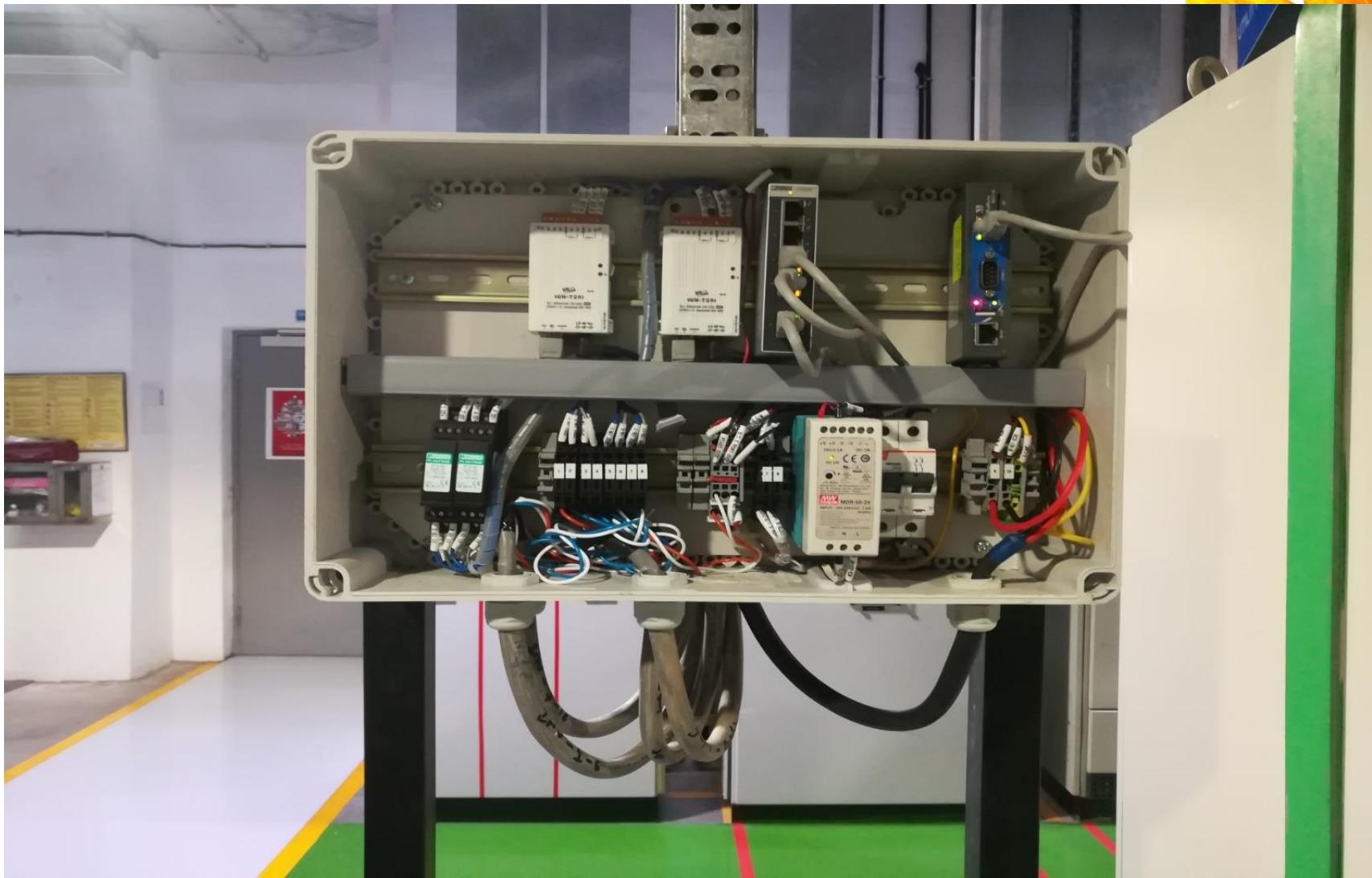
500 kVA DG



DG Multifunction meter



PV-DG controller installing



PV-DG Controller @ site



Monitoring @ Colgate



Colgate PV DG philosophy

Plant Details:

- **PV Plant Capacity :-**

Solar – 16 Inverters – 1285kWp

- **Total DG – :-**

DG 1 CAPACITY – 2000kVA

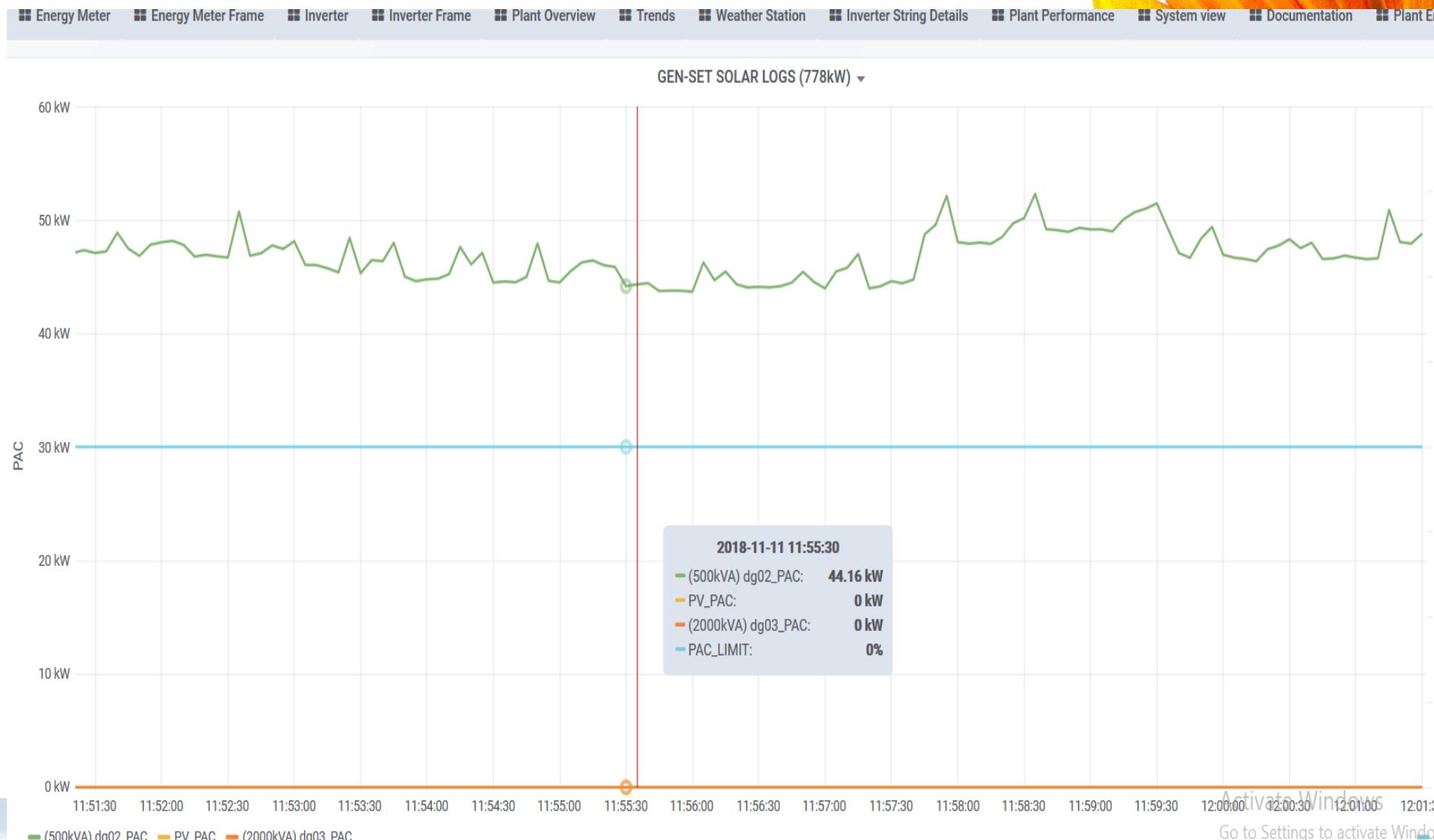
DG 2 CAPACITY – 500kVA

DG 3 CAPACITY – 2000kVA

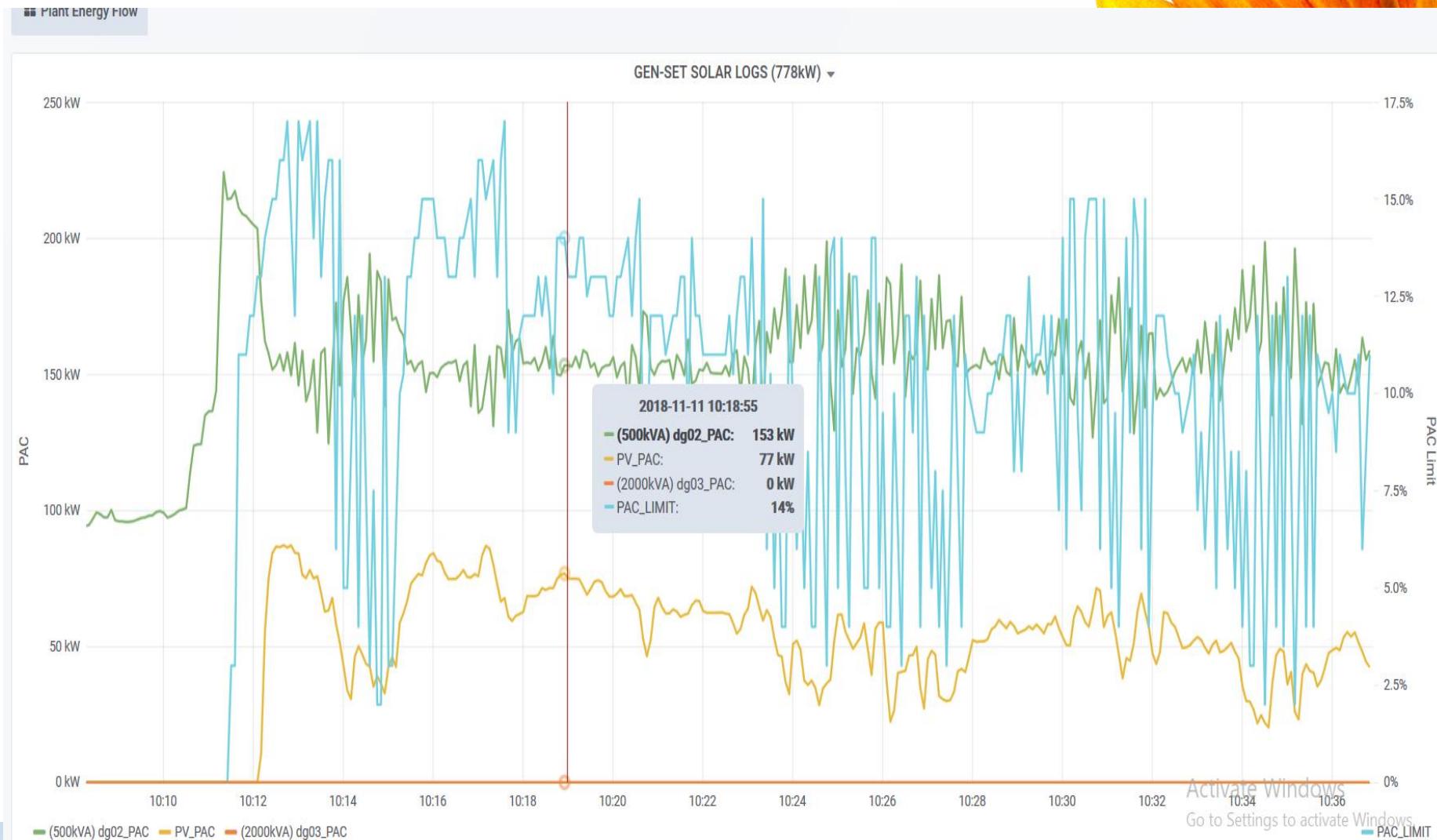
SI No.	Source – Power Supply	Load Bus Active Max Power (kVA)	Bus Bar Active (BC)	Test Cases	Solar System controlled
1	Grid	-	-	0	Control Plant 1 & 2- 16 INV
2	DG 1	< 2000	-	1	Control Plant 1- 6 INV
3	DG 2	< 500	-	2	Control Plant 2- 16 INV
4	DG 3	< 2000	-	3	Control Plant 2- 16 INV
5	DG 2 & 3	< 2500	-	4	Control Plant 2- 16 INV



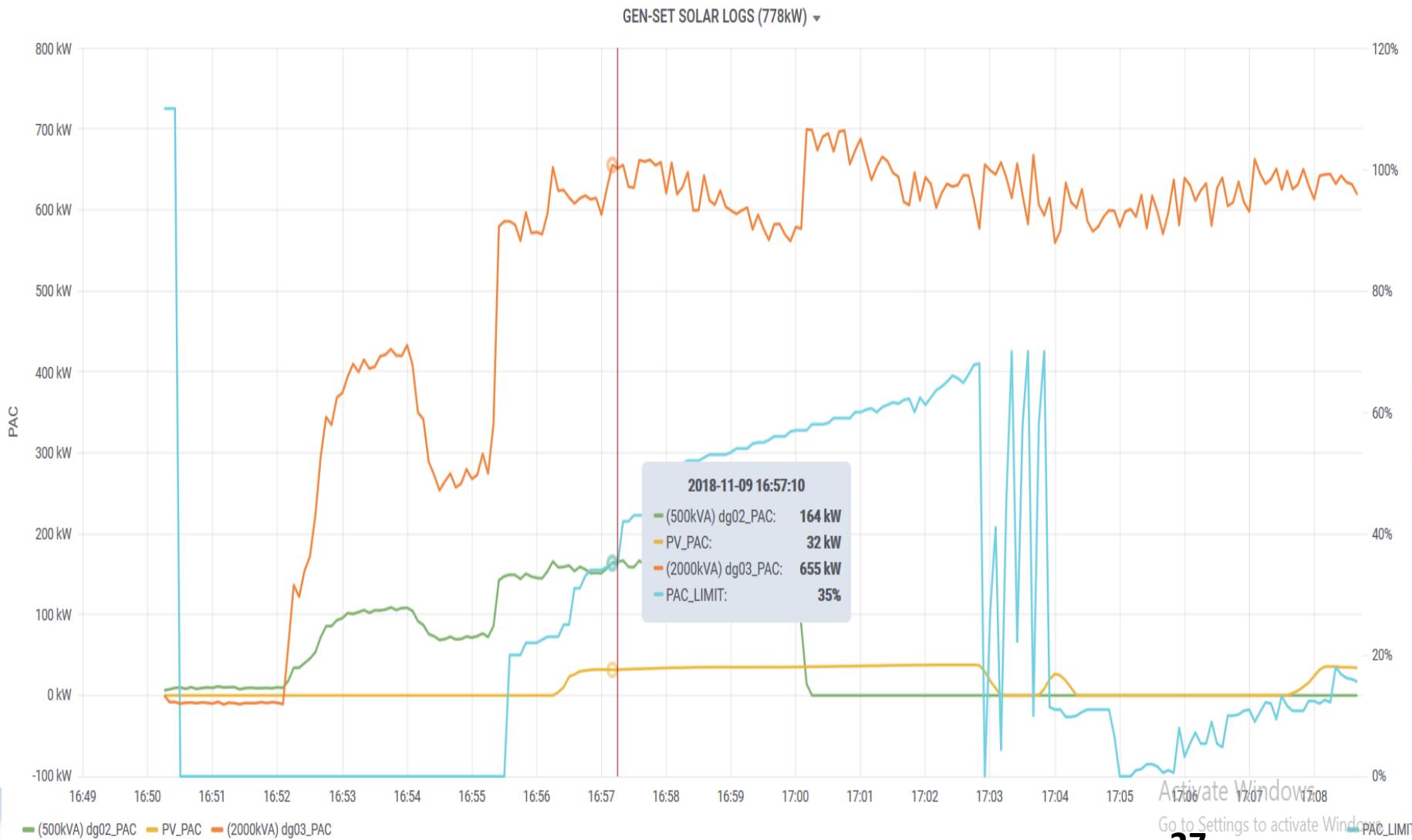
500kVA- DG Active power < DG Critical load (10%), Inverters at 0 kW



500kVA - Dynamic Inverter control maintaining DG @set point



500kVA & 2000kVA - Dynamic Inverter control maintaining DG's @set point



Colgate Live Demo

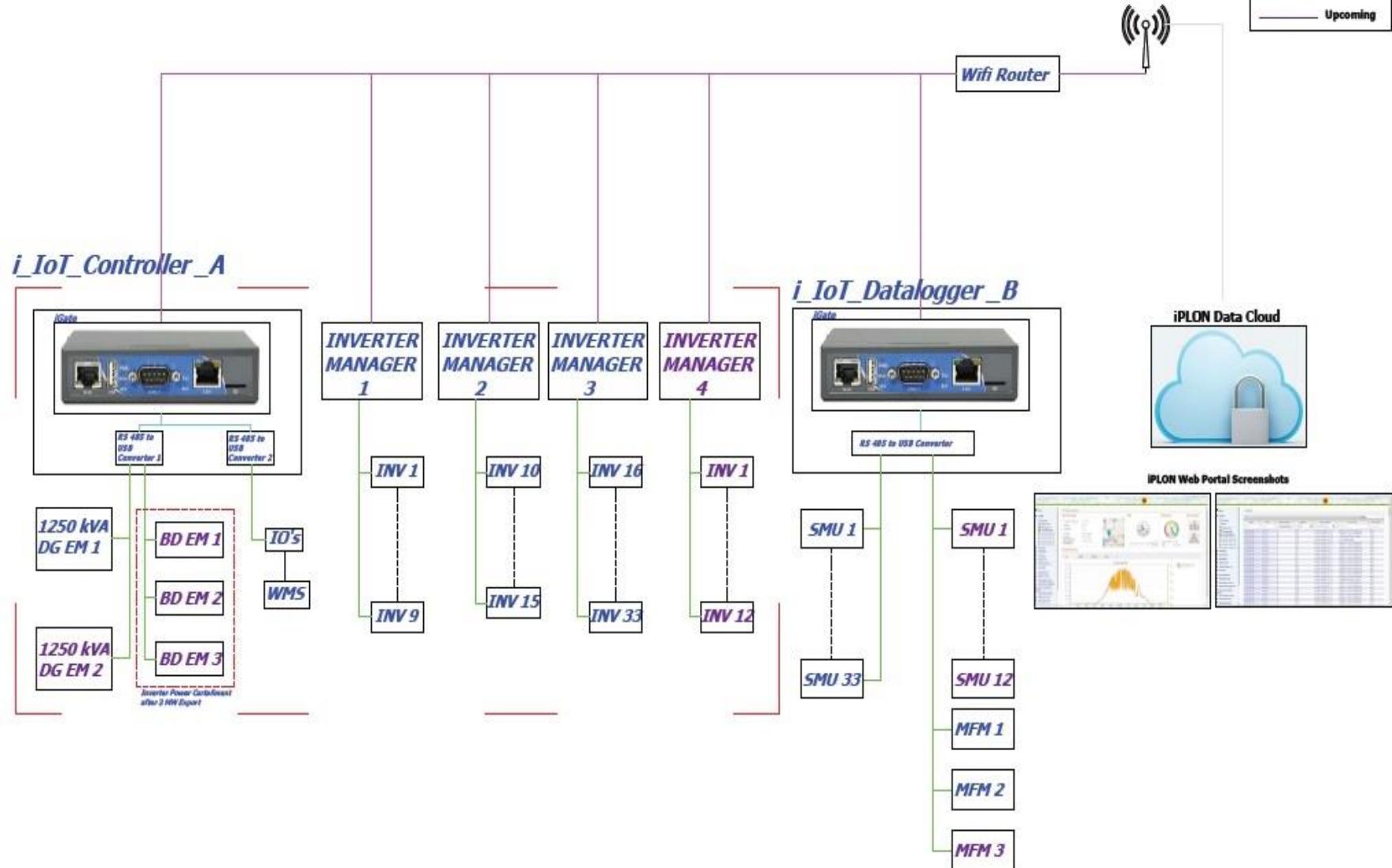
<http://pv-india.eu:3001>



IEML – Expo Centre

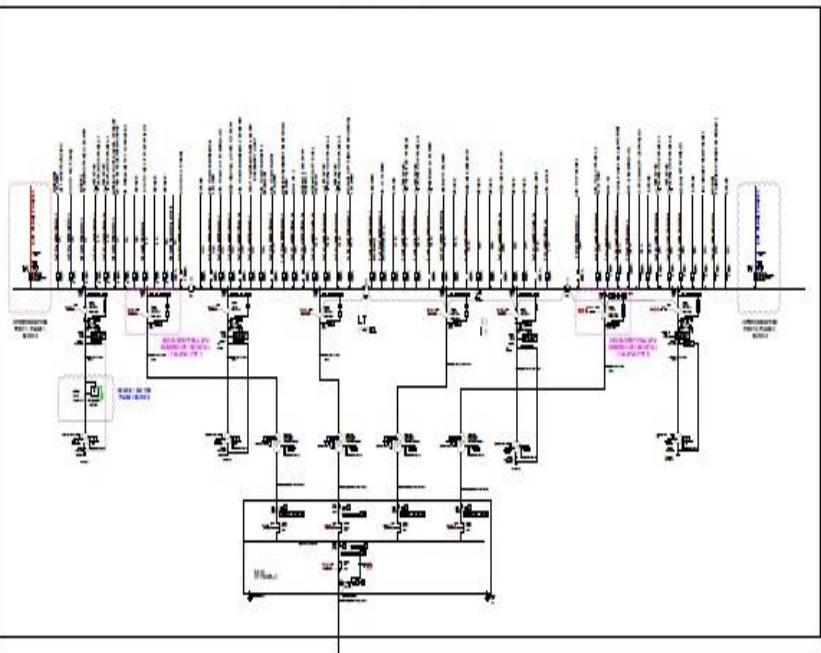


IEML Plant Communication Architectural Diagram



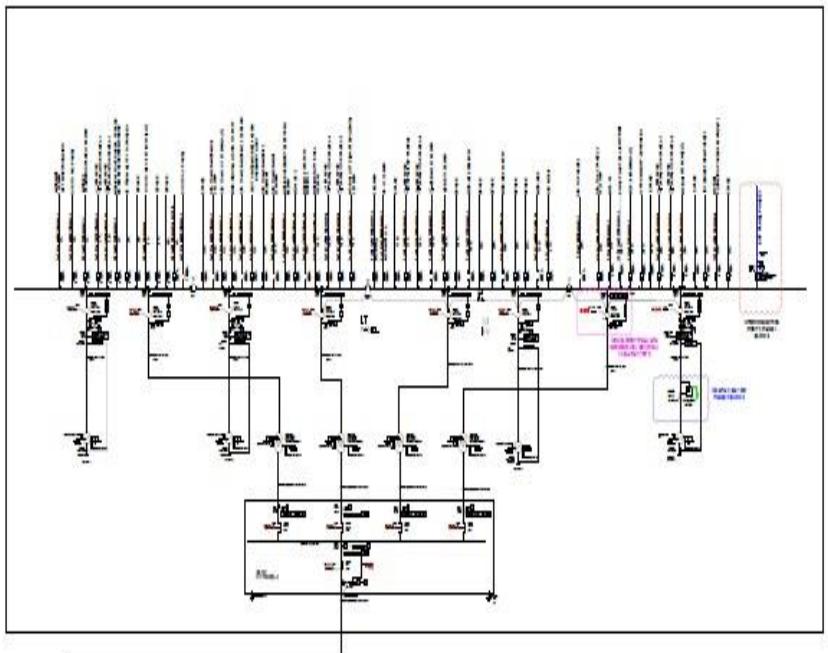
SUBSTATION 1, CLIENT SIDE LT ROOM

HALL 1,2,3,4



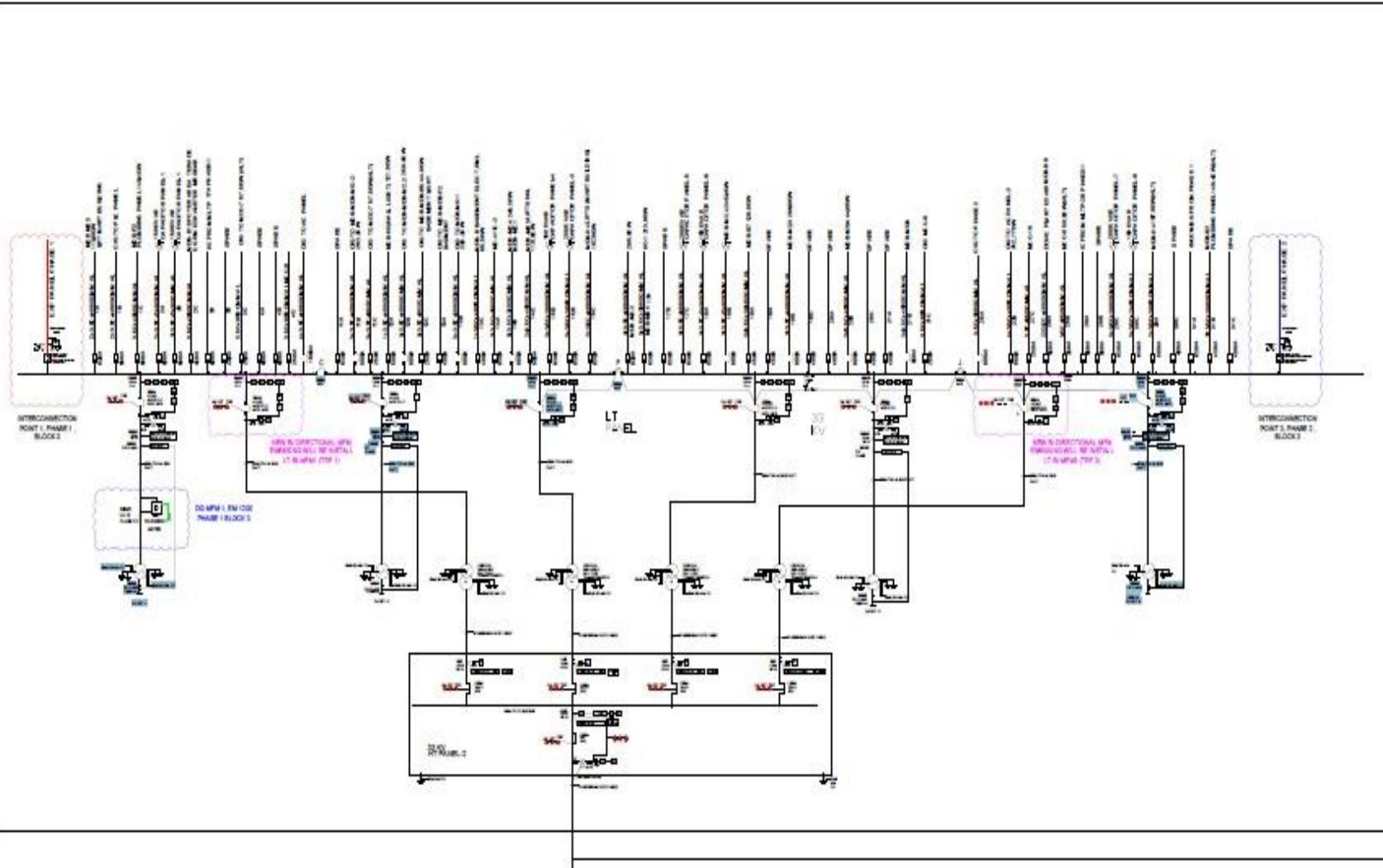
SUBSTATION 2/ CLIENT SIDE LT ROOM

HALL 5,6,7,8



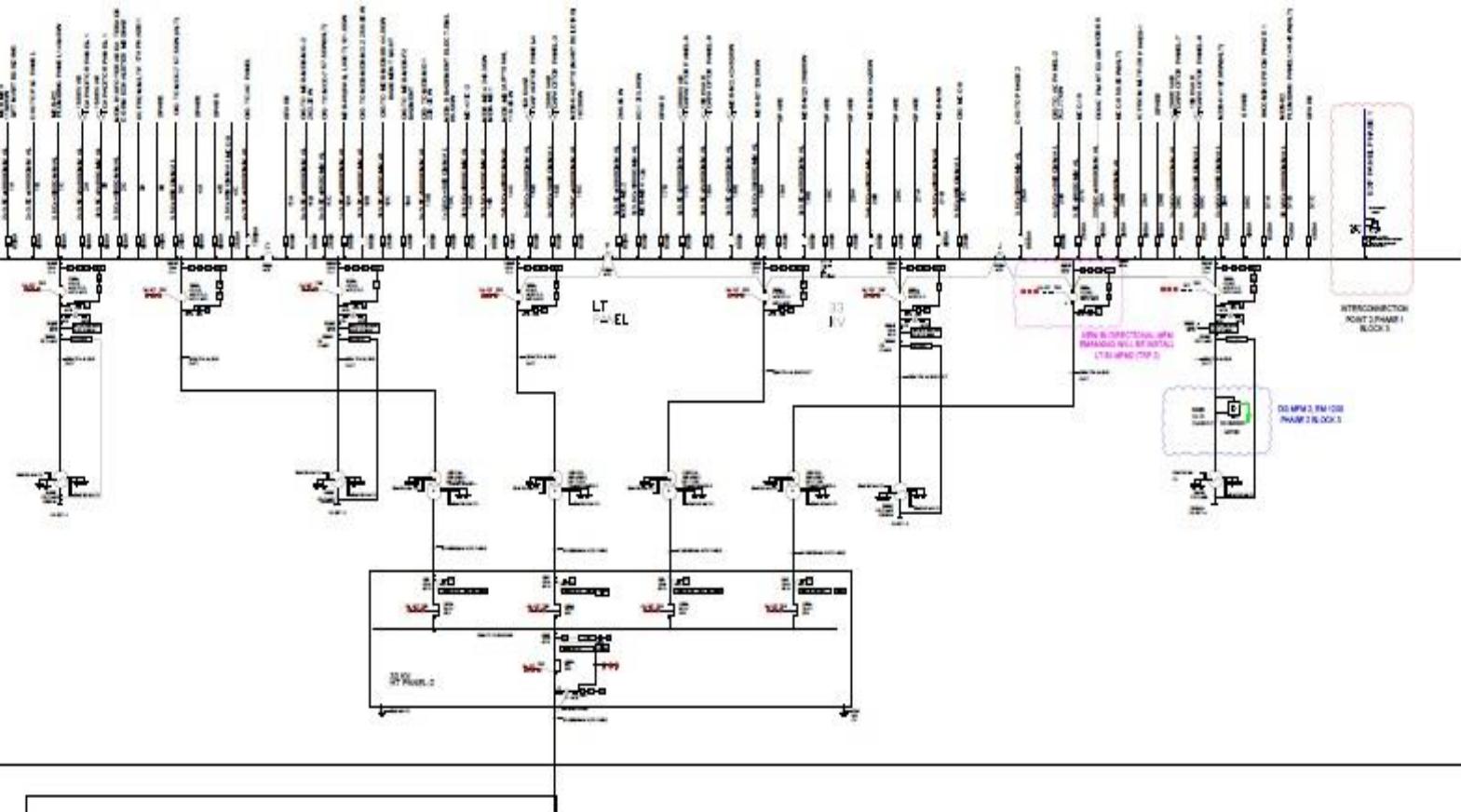
SUBSTATION 1,CLIENT SIDE LT ROOM

HALL 1,2,3,4



SUBSTATION 2/ CLIENT SIDE LT ROOM

HALL 5,6,7,8



IEML PV-ZE & PV-DG Philosophy

Plant Details:

- ✓ **PV Plant Capacity :-**

Solar – 45 Inverters (4 IM's) – 3441.32kWp

- ✓ **Total DG :-**

DG 1 CAPACITY – 1250kVA

DG 2 CAPACITY – 1250kVA

SI No.	Source – Power Supply	Load Bus Active Max Power (kVA)	Bus Bar Active (BC)	Test Cases	Solar System controlled
1	Grid (Summation of 3 Grid Meters)	>- 2000kW	-	0	Control 4 IM's (45 Inv's)
2	DG 1	< 1250	-	1	Control 4 IM's- 45 INV
3	DG 1 & 2	< 2500	-	2	Control 2,4 IM (30 Inv's) and 1,3 IM (15 Inv's) respectively.



IEML Bus coupler – DO Philosophy

IEML Phase II has 3 DO's

1. ACB1 – Phase 1 I/C1 → IM 2
2. ACB2 – Phase 1 I/C2 → IM 1 & IM 3
3. ACB3 – Phase 2 I/C3 → IM 4

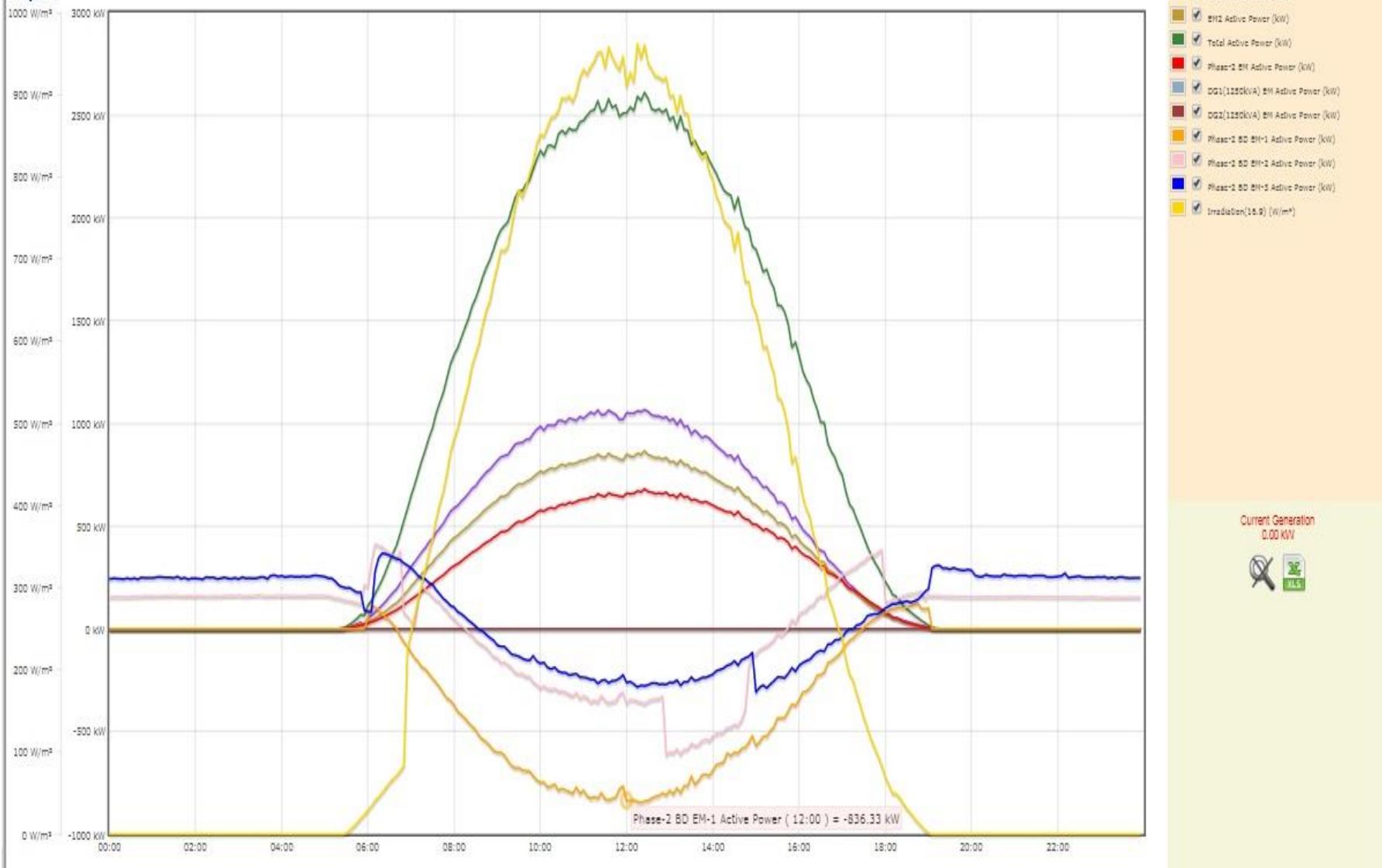
DO's RESPONSE TIME – 7 to 10 sec

CASE 1: DG1 & DG2 running:-

1. Break IM2 communication (DG1) – observe DO1 activation & ACB1 tripping
2. Break IM1 or IM3 communication (DG2) – observe DO2 activation & ACB2 tripping
3. Break IM4 communication (DG1) – observe DO3 activation & ACB1 tripping
4. Break IM1, IM2, IM3 communication (DG1 & DG2) – observe DO1 & DO2 activation & ACB1 & ACB2 tripping
5. Break IM2, IM3 communication (DG1 & DG2) – observe DO1 & DO2 activation & ACB1 & ACB2 tripping
6. Break IM1 & IM2 communication (DG1 & DG2) – observe D01 & D02 activation & ACB1 & ACB2 tripping
7. Break IM1, IM2, IM3, IM4 communication – observe D01 & D02 & D03 activation & ACB1, ACB2, ACB3 tripping



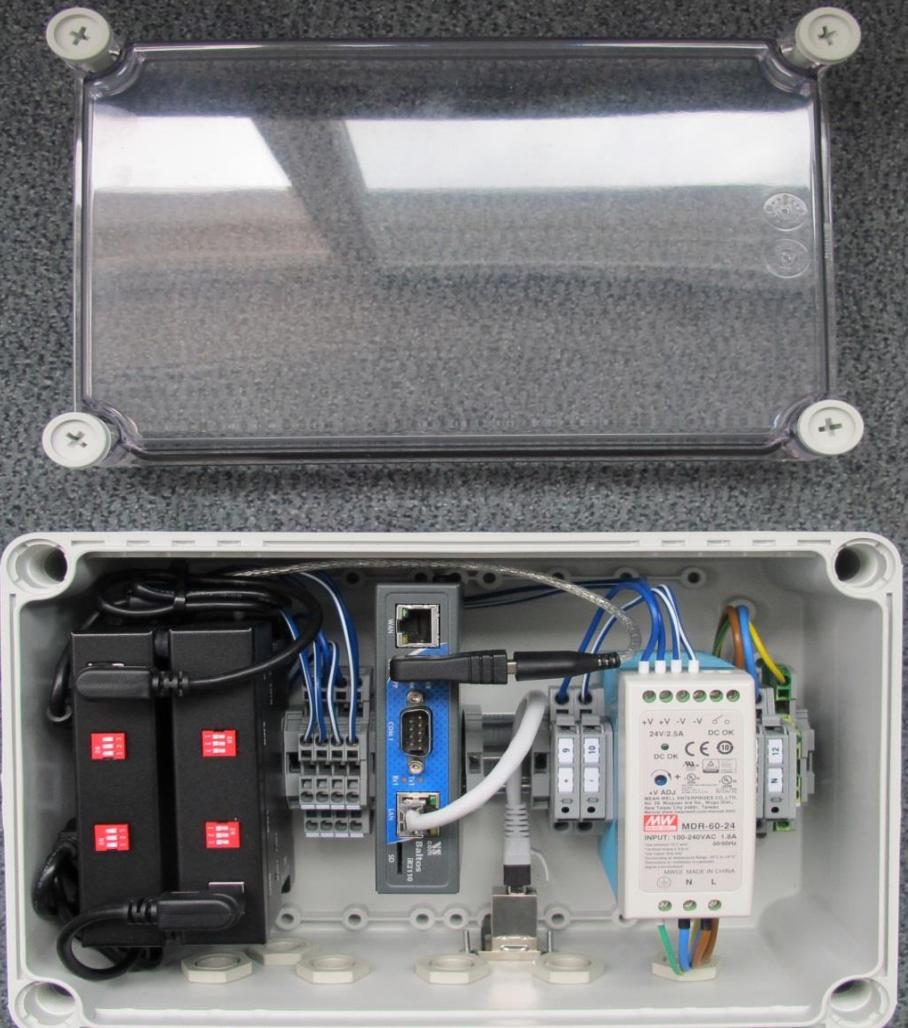
Graph-1



13 + Walmart India



PV-DG Systems for Walmart



PV-DG Hybrid Projects

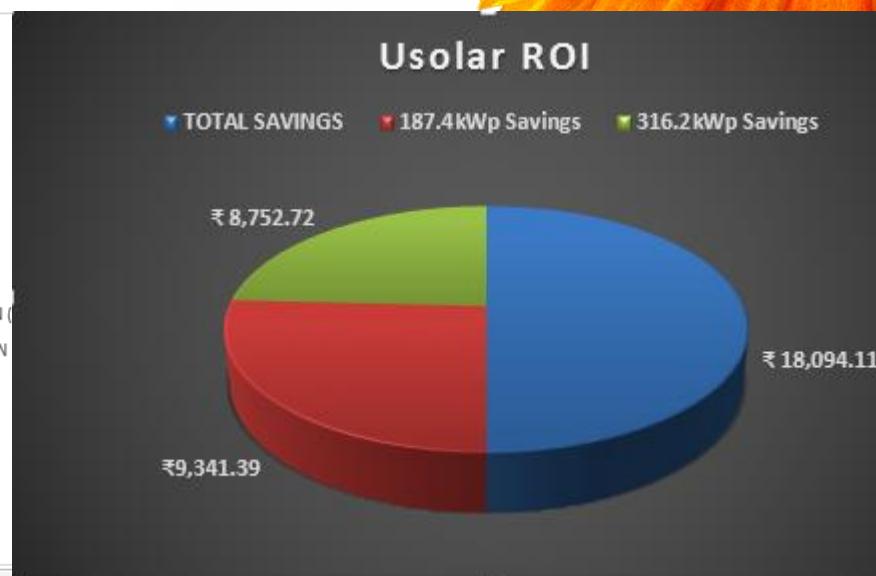
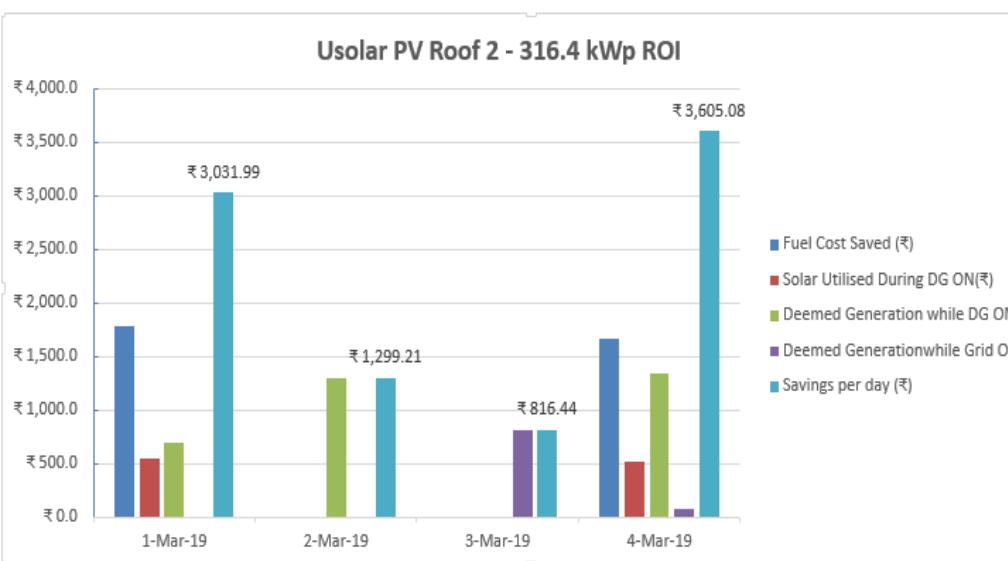
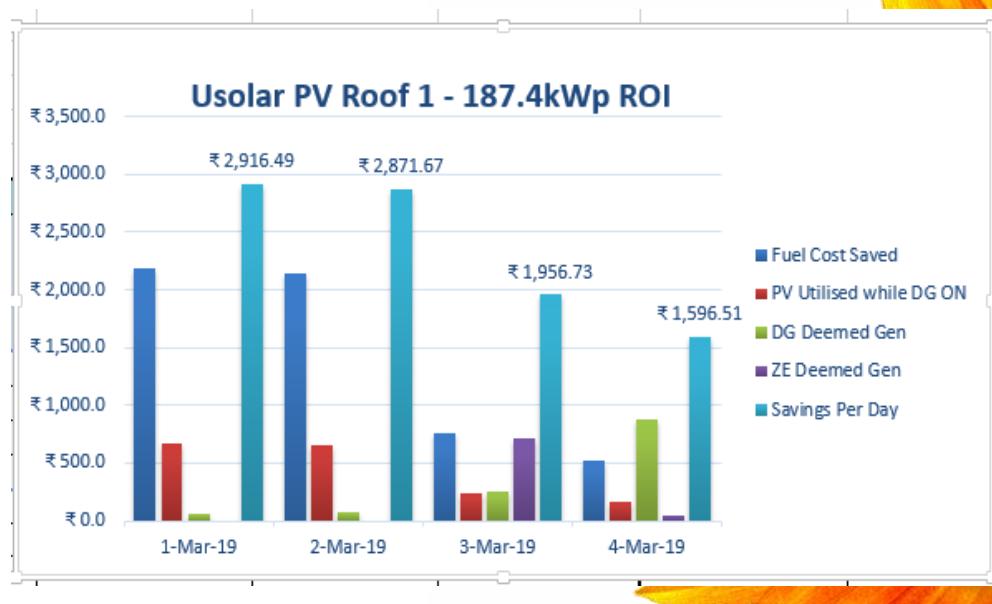
(Specified from list above)

Customer	Location	Capacity (MW)
Amplus	Meerut 1; 2 DG	
	Raipur; 2 DG	
	Agra 1; 2 DG	
	Agra 2; 2 DG	
	Kota; 2 DG	
	Guntur; 2 DG	
	Amristar; 2 DG	
	Bhantinda; 2 DG	
	Bhopal; 2 DG	
	Indore; 2 DG	
	Jalandar; 2 DG	
	Ludhiana; 2 DG	
	Zirakpur; 2 DG	
	Gurgaon; 1 DG	
	Haryana; 1 DG	
	Meerut 2; 1 DG	
	Roorkee; 5 DG	
	Noida; 2 DG + ZE	
	Cumulative	16.2



PV-DG-ZE ROI

Plant Name	Natural Remedies_503.6kWp
PV1 Capacity	187.4 kWp
DG1 Capacity	500 kVA
DG2 Capacity	180 kVA
Total DG Capacity	680kVA
PV2 Capacity	316.2 kWp
DG1 Capacity	750 kVA
DG2 Capacity	250 kVA
Total DG Capacity	1000 kVA



iPLON PV DG Versions

- Single DG & PV
- Two DG (Non synchronized) & PV
- Multiple DG's (synchronization) & PV
- Multiple DG's (Non synchronized) & PV
- Single DG, ZE & PV
- Two DG (Non synchronized), ZE & PV
- Multiple DG's (synchronization), ZE & PV
- Multiple DG's (Non synchronized), ZE & PV

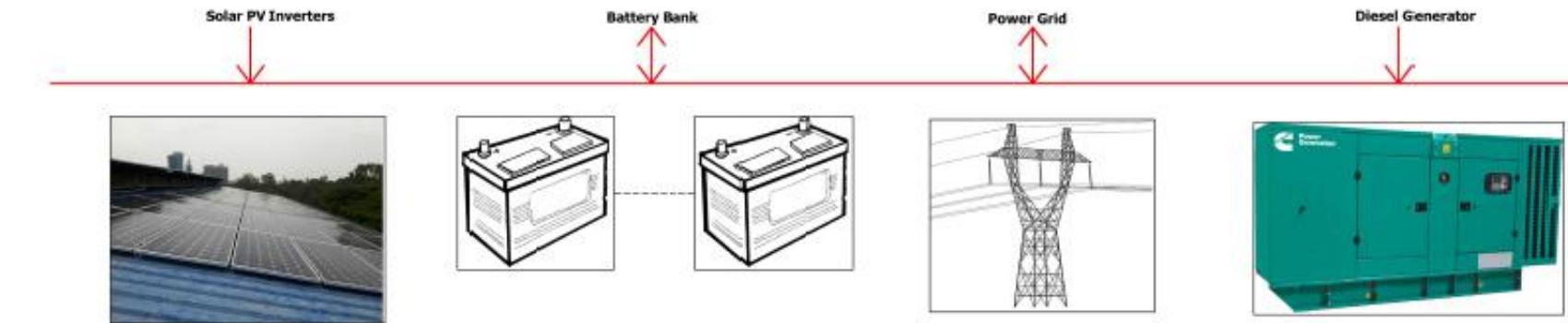


PRODUCT FEATURES- Commercial

- Extended to Multiple DG sets
- Compatible with all leading inverter OEM
- iPLON Cloud services – Remote monitoring of plant
- Scalable system (kW to MW scale installations)
- Fuel savings by maximizing solar output without compromising DG efficiency
- Site specific customization
- Best fit – commercial & future needs



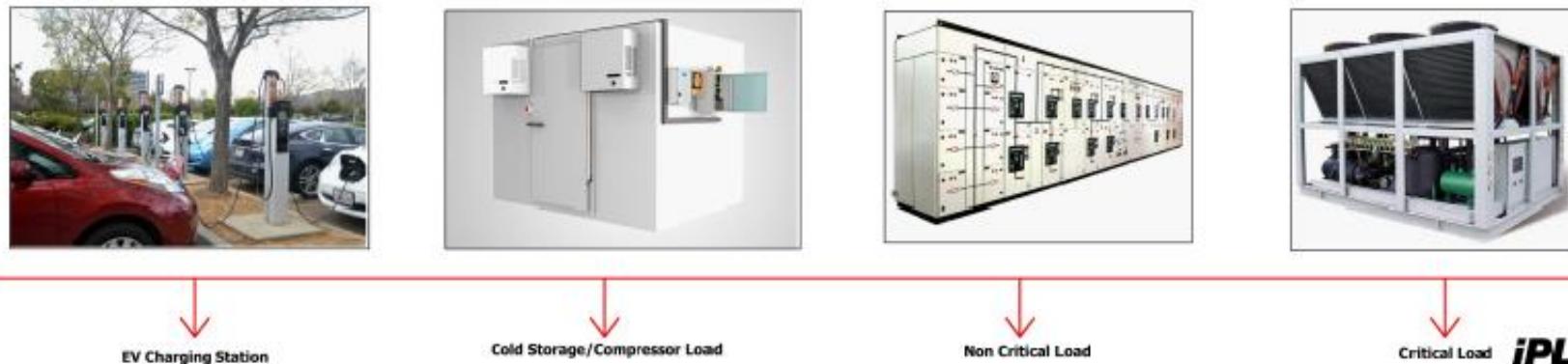
iPLON Micro Grid Solutions_iMGS



Supply Side Management



Demand Side Management



Thank You!

www.iplon.in

<http://re2tn.org/>

www.youtube.com/user/iPLONChannel

