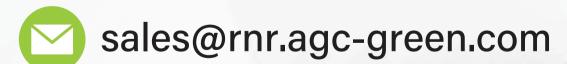


# CORPORATE PROFILE





- mr.agc-green.com
- Suite# 314,3rd Floor, Anum Estate, Shahrah-e-Faisal,Karachi, Pakistan

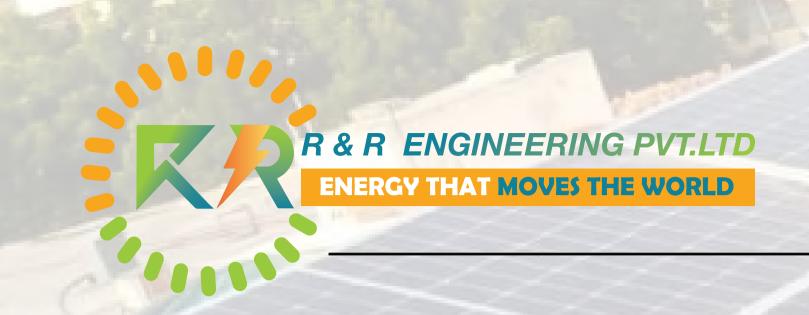




visit us: www.agc-green.com



|    | COMPANY INTRODUCTION | 01 - 02 |
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R & R Engineering Private Limited is a leading Engineering Procurement, Supplier and Construction Company for Electrical, mechanical and Renewable energy solutions (Solar PV and Wind Turbine) for Industrial, commercial and domestic, with optimum mix of quality and timeliness, thereby giving maximum value to the customers. Who is R & R? Established in 2004, R & R Engineering PVT. LTD has been supplying high quality power solutions into various market sectors building a long history of satisfied customers.

R & R Engineering Private Limited specialized in Solar PV and Wind Turbine Energy generation systems, Electrical installation, lighting solutions, Cable networking and Data Communication systems. We are authorized distributors and importer of world's best Manufactures of Solar PV panels and inverters, switchgears, Electrical transformer, AVR (Automatic Voltage Regulator), Led Lights solutions and AC/DC Electrical cables etc.

Today, we stand among top providers of Solar PV and Electrical components like SMA, Fronius, Victron Energy, Jinko, Trina, ABB, Schneider Electric, Terasaki, Solar Watt, Energy, tesvolt and many more, Along with installation in Pakistan as well as in the UK, (Herts Renewable Energy Solution LTD) with our clients ranging from Home honors to commercial and Industries. Advance Group of Companies consists of Herts Renewable Energy Solutions LTD based in UK and R & R Engineering PVT. LTD based in Karachi, Pakistan.

Our service is what makes us stand out from other providers, in parallel with Herts Renewable Energy Solutions we are able to bring world class quality and innovative technique from UK to Pakistan. Therefore, allowing us to satisfy our highly loyal clients with best top quality under competitive rates. We have a strong fan following in different markets, that is, Off-Grid, Renewable – Solar & Wind, Telecom, Steel mills, Textile Industrials, Pharmaceutical, Chemical industries, Automotive, Supply Chain, Military and many more.



# Mission

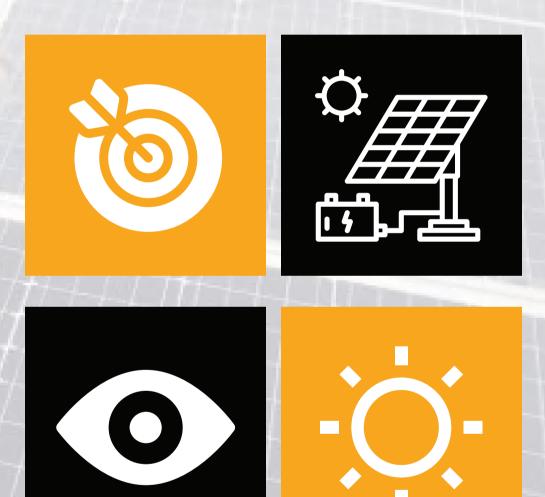
We turn effective ideas into reality, by precise understanding of your exact requirement. Empowering people with technological independence is our specialty. Our aim is to accelerate the adoption of Solar PV technology across the country and provide an environmentally friendly, sustainable and conflict free Energy and to help in eradicating the menace of load shedding and thereby, fueling the development in Pakistan.

Our aim is to accelerate the adoption of technology across the country and provide an environmentally, friendly and sustainable Solutions.

# Vision

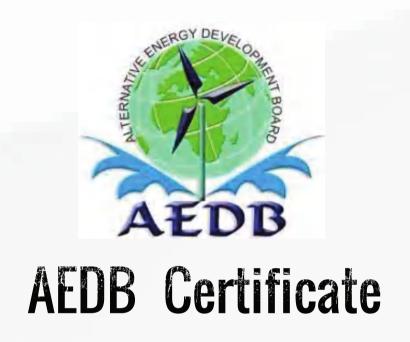
Our vision is Energy Self-reliant Pakistan, focusing on self-production, energy reliability and assuring a promising future for the coming generations. R & R Engineering Private Limited will enrich the lives of Pakistani households, commercial, industrial and farm customers as a caring and reliable provider of the most appropriate solar PV power technology solutions which bring them the best value

We will build a learning culture for our team members which emphasize the highest levels of reliability, competence and integrity which will be the essence of our brand.









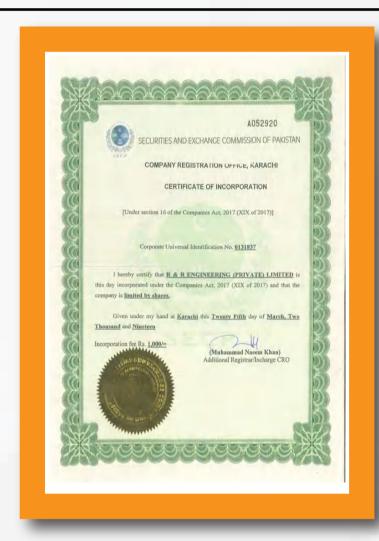














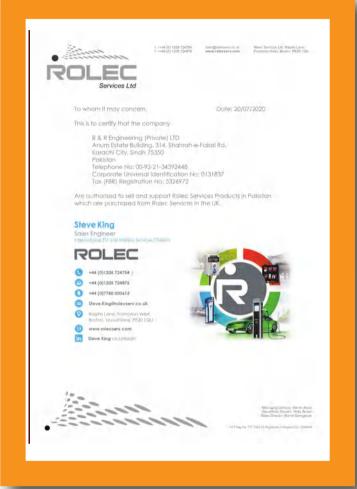






WALLPOD:EV

Manufactures **Authority letters** 







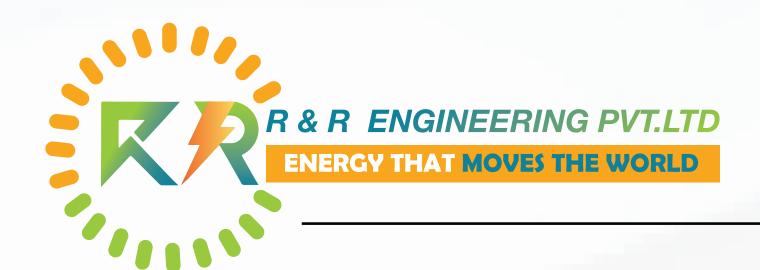




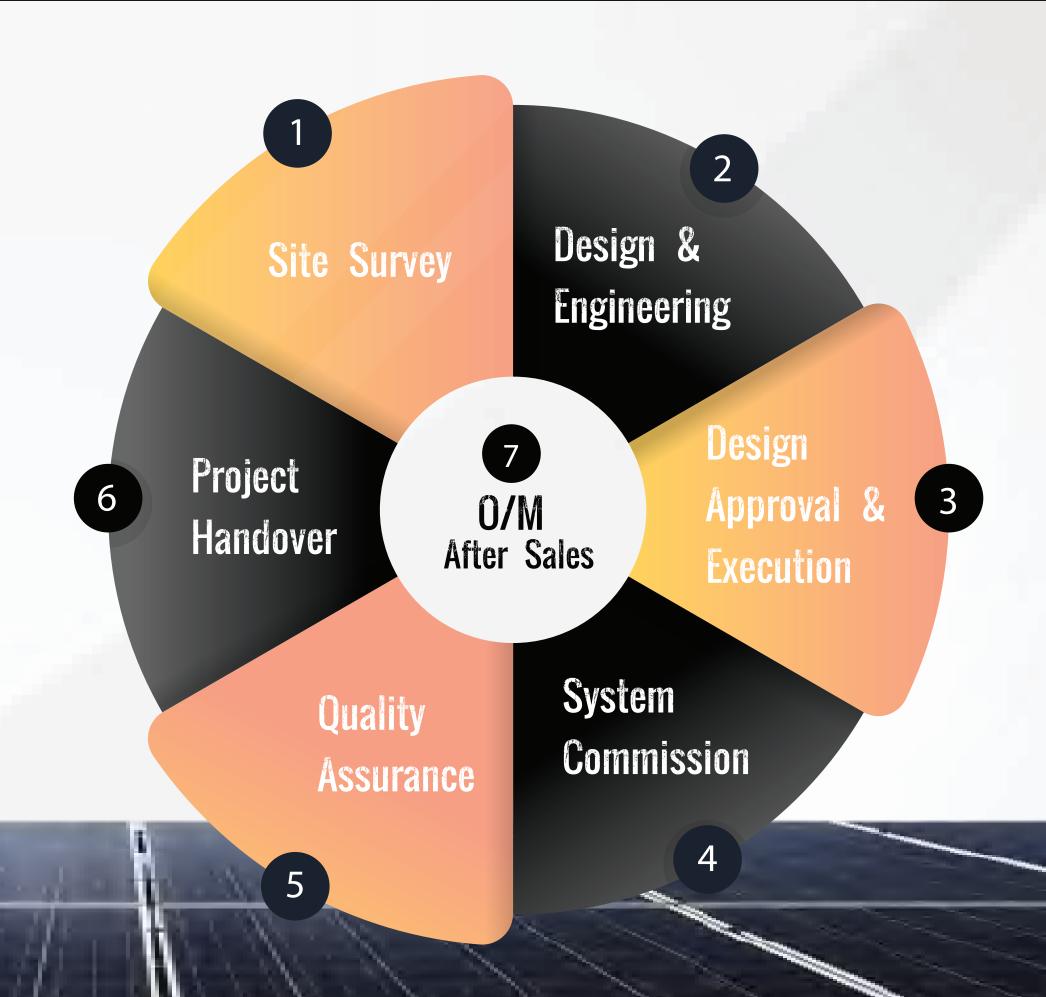




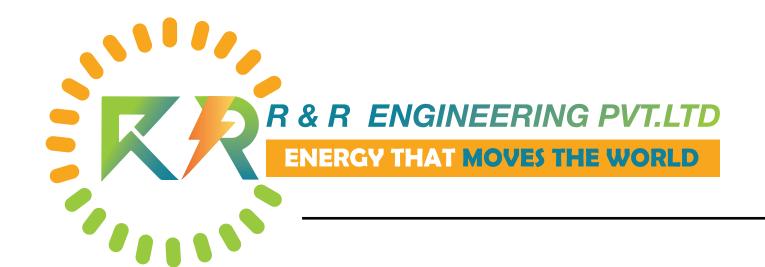




# Our Working Process



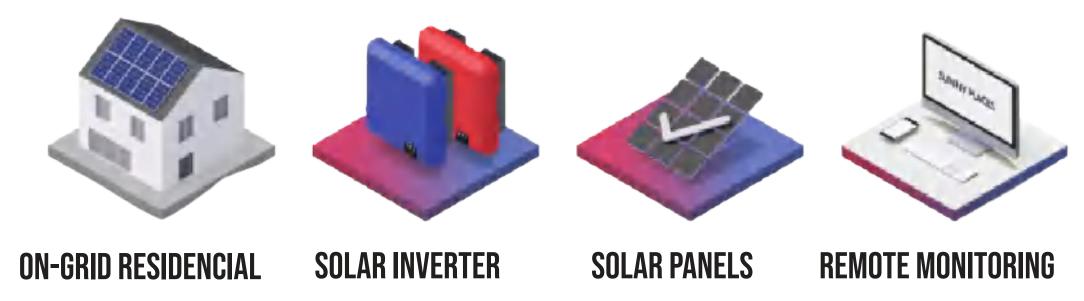




# SOLAR ON-GRID SYSTEM

A grid connect system can have any type of generation whether it be solar PV, wind or hydro. This then connects into your distribution board and generated power is first used within the property to reduce electricity consumption and any surplus is exported to the grid. (Net-Metering) Note that if the grid supply fails, to protect linesmen working on the grid, the system will shut down.

## RESIDENTIAL



# What it can offer you

This simple system can be a very wise investment allowing you to:

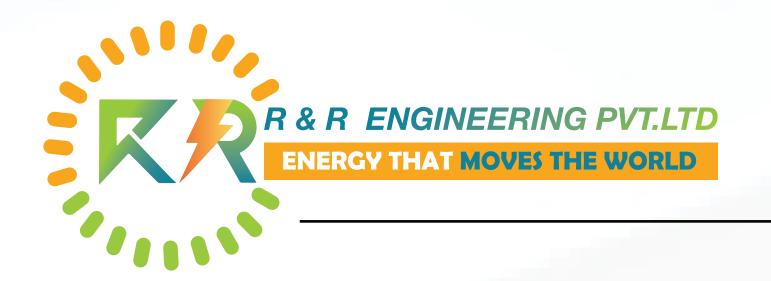
- Reduce your electricity consumption and your bills up to 70% in some cases.
- Get paid for the electricity you export to the grid (Net metering)
- Protect yourself against rising future energy costs
- Reduce your environmental impact
- Increase the value of your home

# COMMERCIAL



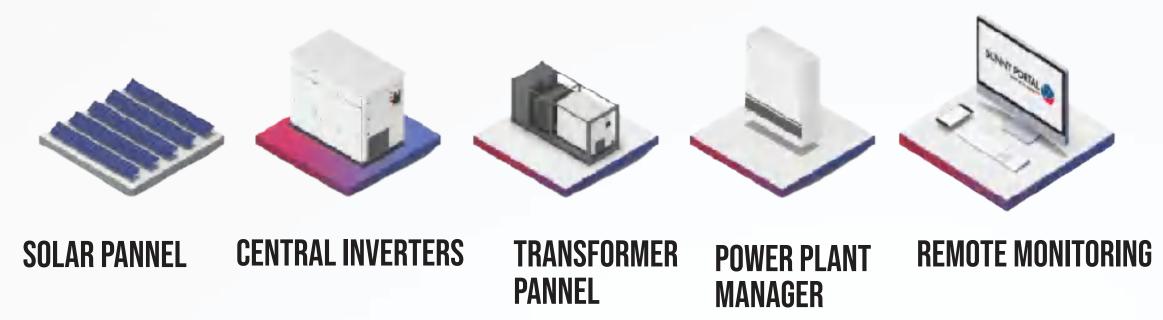
# Commercial On - Grid Solar PV Solutions From 25KW to MWs

- ♦ Tier -1 Solar PV Panels with top of the line cut cells technology.
- World's leading German inverter SMA with SMA Shade fix technology.
- On-line Monitoring control with Smart connect Energy App.
- Net Metering Approved.
- Complete installation as per local and international safety standards.
- Other components and cables from top branded manufacturers.
- 5 years workmanship guarantee.



# SOLAR ON-GRID SYSTEM

# INDUSTRIAL



# Benefits

- Save up to 40% on energy costs
- Protection against rising energy prices
- Additional income from grid feed-in (Net metering)
- Particularly high yields possible and rapid ROI (return on investment)
- Tax benefits through deduction of capital expenditure and special depreciation
- Enhanced image through demonstration of commitment to climate protection and conservation of resources

# How Does LEED work?

Project pursuing LEED earn points for various green building strategies across several categories based on the number of points achieved, a project earns one of four LEED rating levels:

| 200               | 140                 | 464                 | 1                   |
|-------------------|---------------------|---------------------|---------------------|
| Platinum          | Gold                | Silver              | Certified           |
| 80+ points earned | 60-79 points earned | 50-59 points earned | 40-49 points earned |

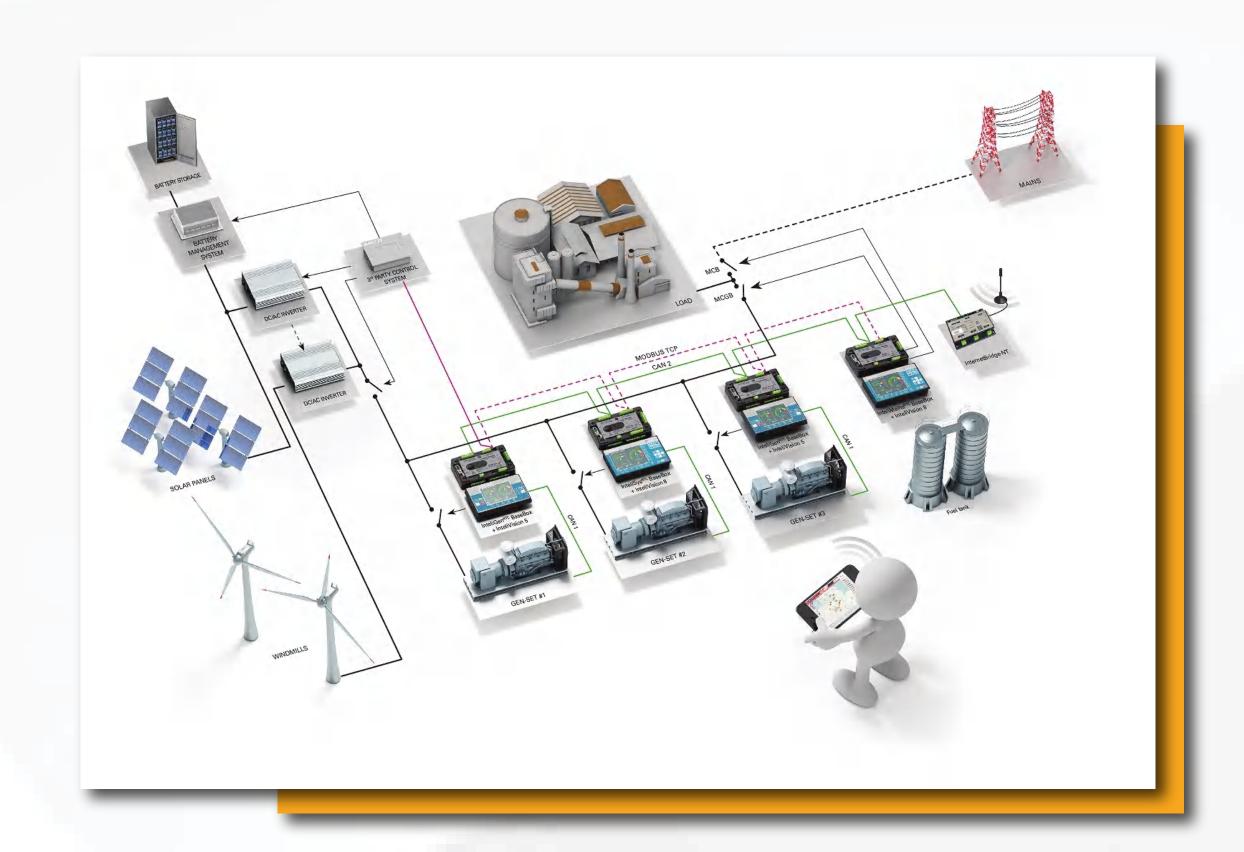
Solar projects can provide a major contribution toward LEED certification. The primary LEED category pertaining to solar is the "Energy & Atmosphere" category, specifically EA Credit 2, the "On-Site Renewable Energy" credit. This credit can provide up to 7 possible LEED points. This could represent over 17% of the points required for certification.

The number of LEED points awarded is determined by the percentage of the facility's energy costs that are offset by on-site renewable energy

| Percentage of Renewable Energy | <b>LEED Points</b> |  |
|--------------------------------|--------------------|--|
| 1%                             | 1                  |  |
| 3%                             | 2                  |  |
| 5%                             | 3                  |  |
| 7%                             | 4                  |  |
| 9%                             | 5                  |  |
| 11%                            | 6                  |  |
| 13%                            | 7                  |  |



# HYBRID INDUSTRIAL SOLUTION



# Key Features















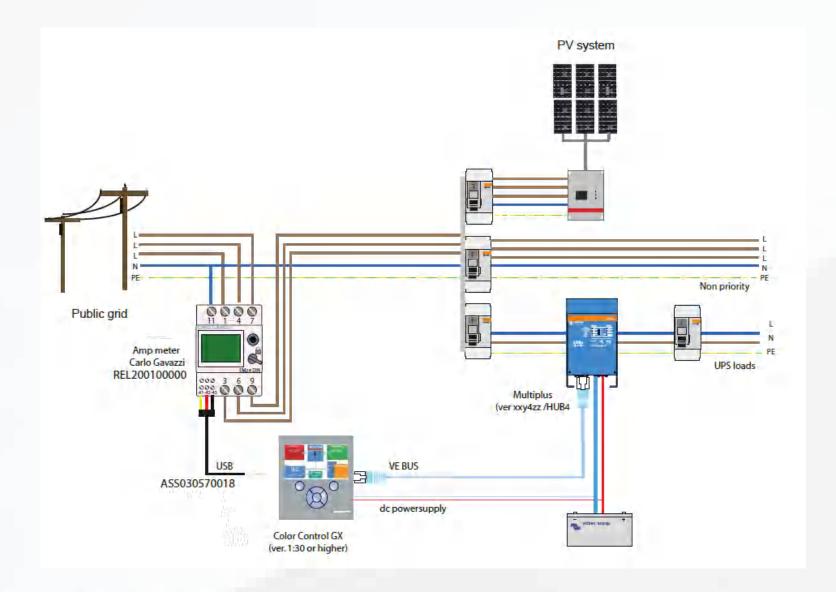




# SOLAR PV ON-GRID SYSTEM WITH BACK-UP

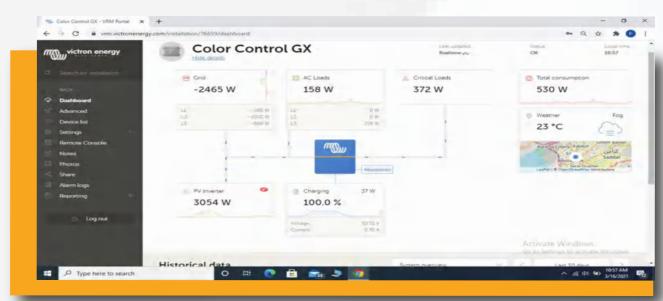
# \*AC-COUPLE SYSTEM ESS (Energy Storage System)

Here the battery is connected on the PV side of the solar inverter (possibility with most of on-grid inverters). A battery is used to store the energy when it's generate energy from solar PV. There is some (slight) reduction in the PV feed in tariff due to energy used in battery charge/discharge process

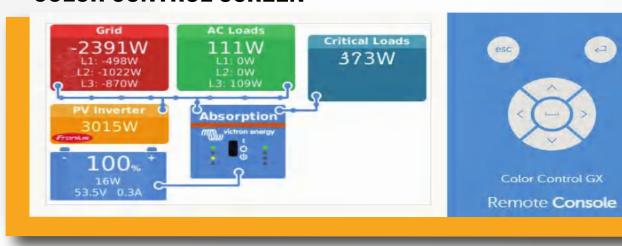


- Here the battery is connected on the AC side of the solar inverter
- An additional battery inverter/charger is required to convert battery power to 230 Vac and vice versa
- There is no effect on the PV feed in tariff
- Possible to charge the battery from cheap rate electricity
- Back-up Energy possible in the event of grid failure.

### **REMOTE MONIOTORING**



### **COLOR CONTROL SCREEN**



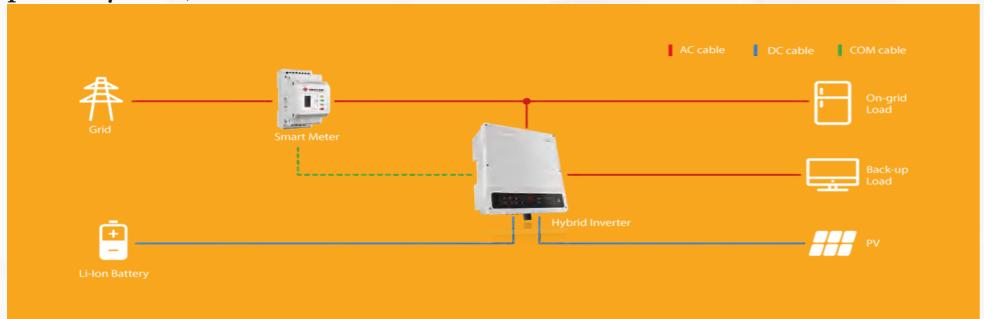


# SOLAR PV ON-GRID SYSTEM WITH BACK-UP

# \*HYBRID TYPICAL APPLICATION

- Enhance self-consumption: During the day, the electricity from the PV array is used to optimize self-consumption. The excess power charges the batteries, whose power supplies the loads at night. By utilizing storage, the self-consumption can reach up to 95%.
- Benefit from peak saving: By setting the charging and discharging time, the battery can be charged using the electricity generated at off-peak rates and discharged to fulfill the loads during peak hours (if the grid regulations allow it).

It also allows backup power in the event of grid faliure (also availble in 3 phase system).

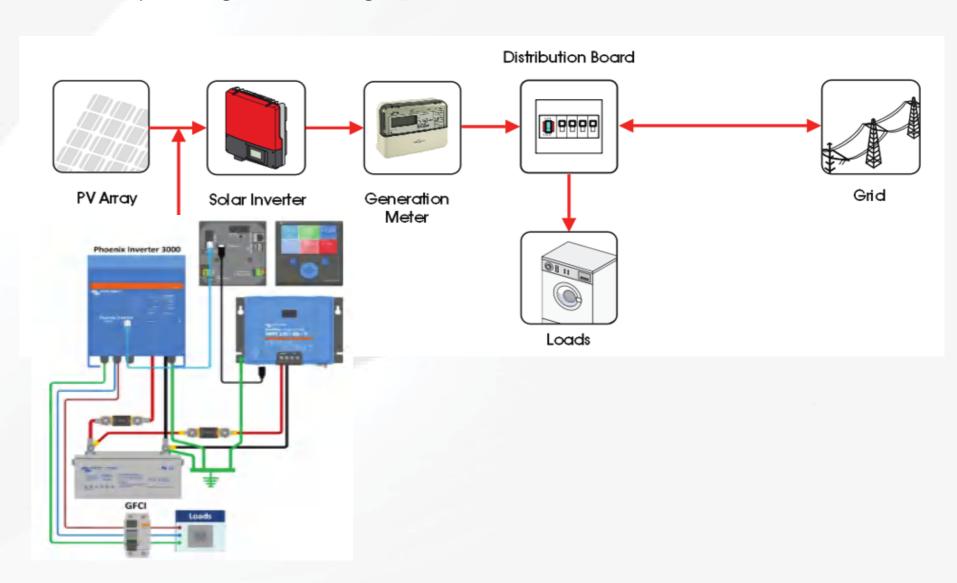


# \*DC-COUPLE SYSTEM

Here the battery is connected on the PV side of the solar inverter

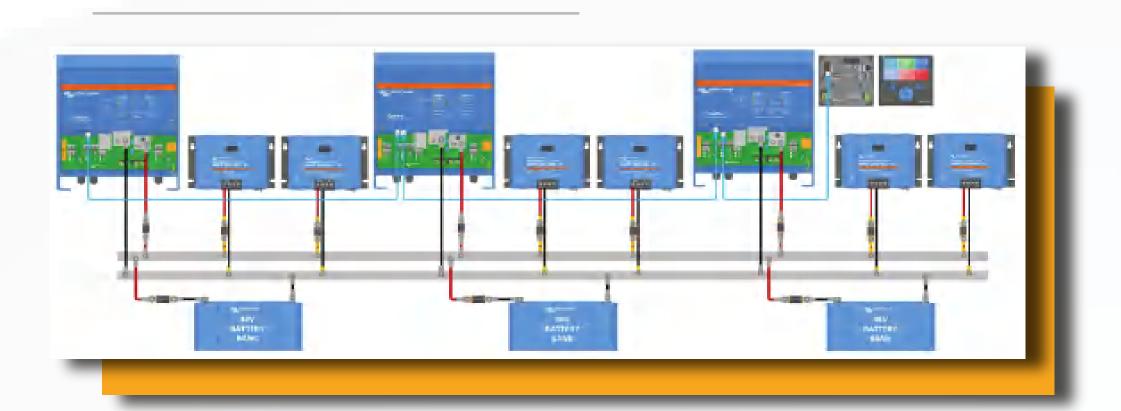
A high voltage battery (to match PV voltage) is used to store the energy when it's generated for when it's needed

There is some (slight) reduction in the PV feed in tariff due to energy used in battery charge/discharge process



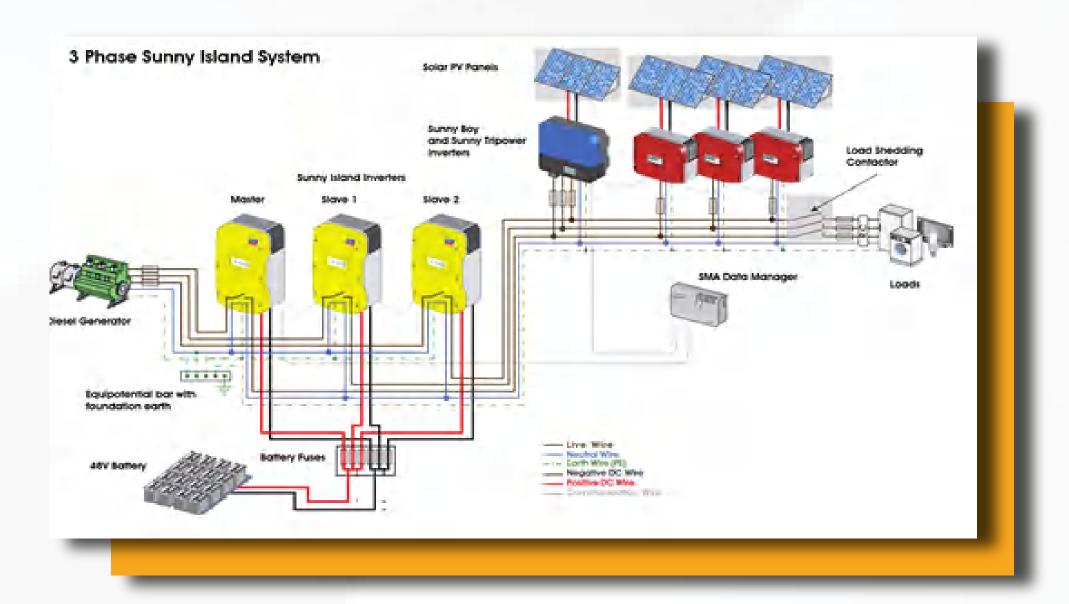


# OFF- Grid & MINI - GRID SOLUTIONS



At present, approximately 1.6 billion people are living without a regular electricity supply, the effects of which include stagnant development and increasing poverty. Many remote areas with scarcely populated areas are without power because connecting them to centralised power would be uneconomical. Many of these locations are ideally suited to benefit from the integration of renewable energy: wind; solar and water power - systems are now possible to allow self-sufficient communities to generate their own electricity from their local resources.

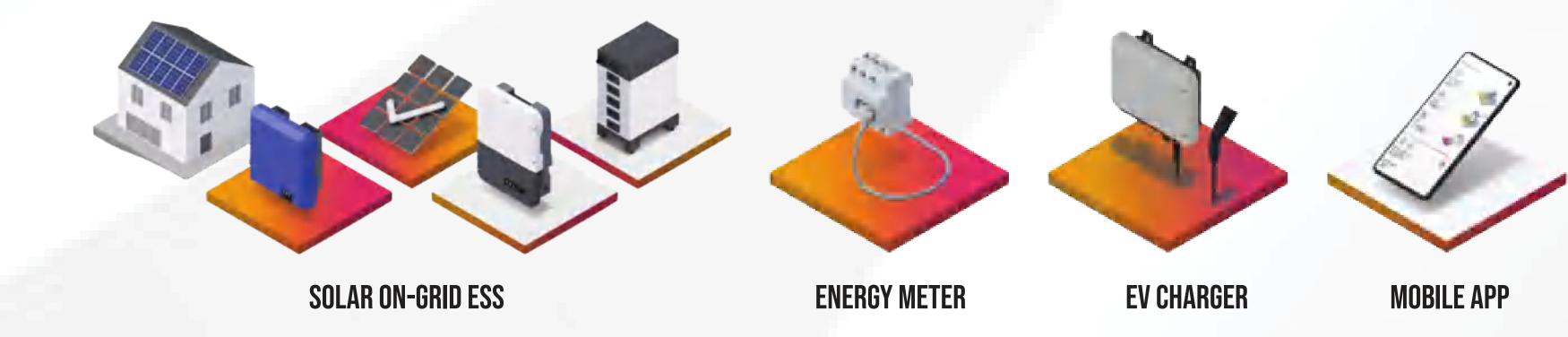
This enables the creation of a local 'mini-grid' which can be easily extended to power additional properties or allow the integration of new renewable generation. Generation can be sited at the most appropriate locations and power delivered across long distances to properties as it is needed.











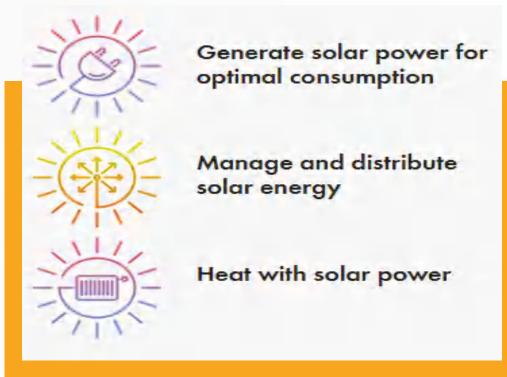


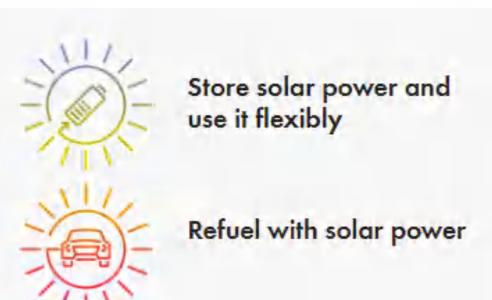
# EV CHARGING POINT

# RESIDENTIAL AND COMMERCIAL SOLUTIONS



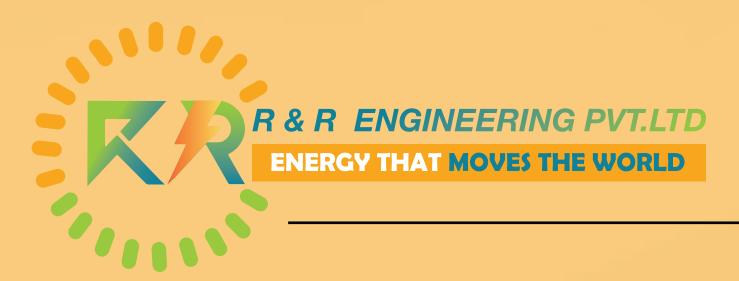






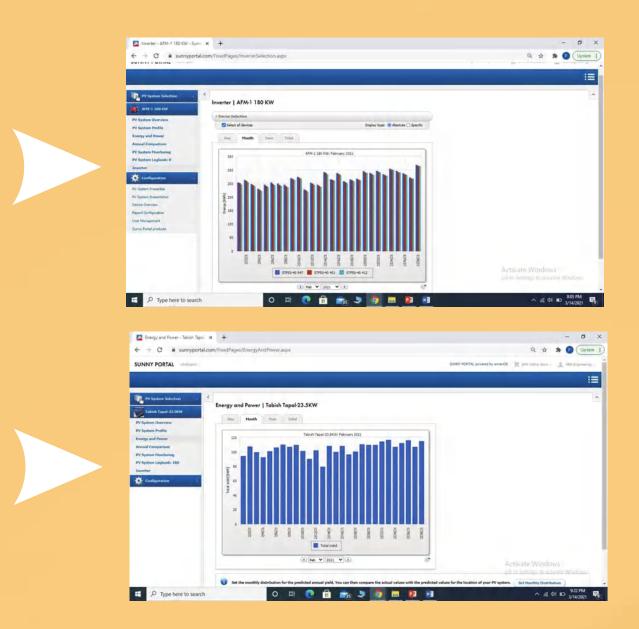






# CONTROL AND MONITORING

| PV System                   | 0        | PV system power [kW] | \$     |
|-----------------------------|----------|----------------------|--------|
| 20 kw                       |          |                      | 25.75  |
| pfizer                      |          |                      | 25.79  |
| Haroon Rashid 10 KW         | 1        |                      | 10,30  |
| Salman sahab - 12Kw         | system   |                      | 10.30  |
| Zahoor ul islam 12,5k       | W        |                      | 10.30  |
| Shariq Wahab                |          |                      | 10.00  |
| bilal solar                 |          |                      | 9.90   |
| Abbas Sayeed 10KW           |          |                      | 8.30   |
| Sadaan Sayeed-6KW<br>System | PV       |                      | 5.20   |
| ghufran                     |          |                      | 2,40   |
| Rashid Mehmood 12.4         | 4 KW     |                      | 10.30  |
| Ali Haider 6,2KW            |          |                      | 6.20   |
| Faisal Sahab-12KW P         | V System |                      | 10.30  |
| shaid 5KW                   |          |                      | 5.00   |
| waleedsajid12kw             |          |                      | 12.00  |
| 10,5KW grid tied sola       | rPV      |                      | 8.83   |
| fahad sahab 7.5 KW          |          |                      | 6.20   |
| Tabish Tapal-23.5KW         |          |                      | 18.10  |
| artistic fabric mill 180    | KW       |                      | 153.00 |
| S.abid15KW                  |          |                      | 15.28  |
| 29.9kwp Residance           |          |                      | 30.26  |









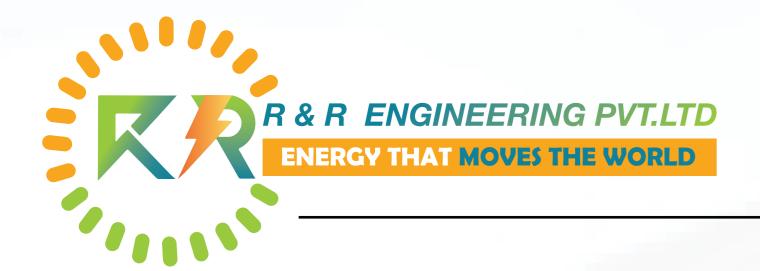
Our renewable energy & solar PV monitoring and solar metering gives you peace of mind over your system's lifetime, all the while helping you achieve your environmental and financial goals.

- ♦ Recommended daily production monitoring
- Deeper monitoring of inverters and/or optimisers
- ♦ All available with monthly or quarterly reporting of electrical and carbon performance.

# Smart electric vehicle charging

- Fill up on sunshine with the SMA EV Charger
- Conveniently manage charging processes
- Forecast-based charging
- Define a charging target and charge at minimal cost
- Smart charging with self-generated solar power
- Fast charging
- Extra-fast charging via the boost function



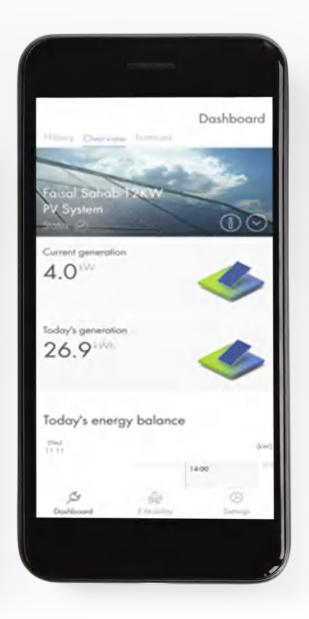


# CONTROL AND MONITORING

# ENERGY APP

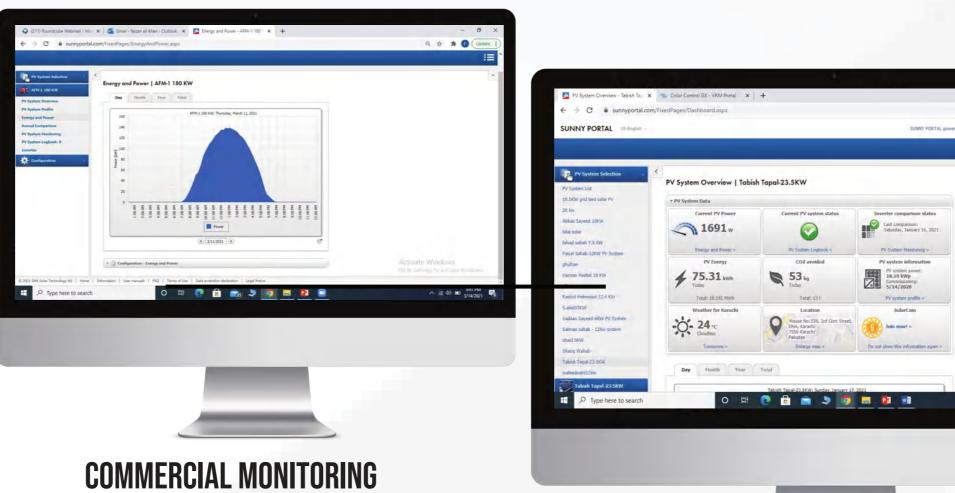


FORECAST-BASED SOLLAR GENERATION



ON-GRID MONITORING

# MONITORING PORTAL





**BATTERY MONITORING** 



**RESIDENTIAL MONITORING** 



# OPERATION AND MAINTENANCE

We are the trusted operations and maintenance partner for many businesses in Pakistan. We deliver peace of mind over your system's lifetime and can maintain optimal performance through EV charger, battery, solar panel maintenance, service, repairs and cleaning.

With industry recognised technical expertise, we are with you for your renewable technology operations and maintenance needs. Including solar PV maintenance, solar panel cleaning services, a system remove and refit, fire protection safety review/upgrade, or system optimisations.

# Testing & Troubleshooting

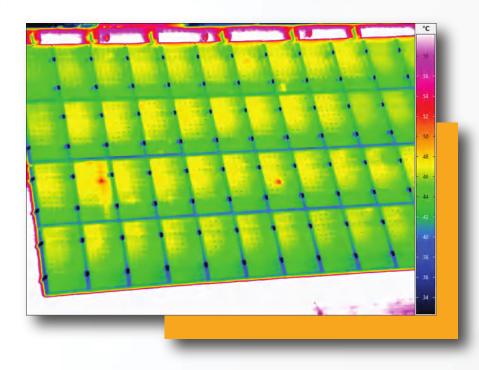
- Inspecting wiring connections and terminations for looseness and corrosion
- Inspecting wiring harnesses to ensure they are neatly bundled and protected
- Inspecting the PV array for cleanliness, absence of damage, and structural integrity
- Inspecting roof penetrations and weather sealing
   Maintaining batteries, which may include cleaning,
   adding electrolyte, charge equalization, and replacement if needed

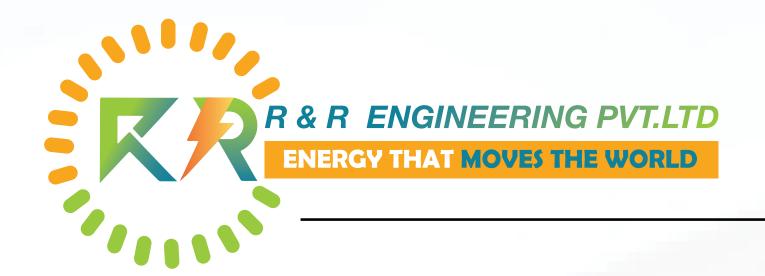


# Thermographic Inspection of Photovoltaic Installations

An infrared camera helps to visualise defects on new and existing installations

- Efficient method for detection of power losses
- Detection of a wide range of local faults and irregularities
- Visualisation allows initial on-site evaluation
- Plant system condition monitoring over time with stored data
- Application in running installations
- State-of-the-art thermographic software for efficient reporting





# ENERGY AUDIT

An energy audit is an inspection survey and an analysis of energy flows for energy conservation in a building. It include a process or system to reduce the amount of energy input into the system without negatively affecting the output. For industrial applications, it is the HVAC, lighting, and production equipment that use the most energy, and hence are the primary focus of energy audits. Power Factor improvement is another major concerned in case of a lot of inductive load connected to the facility.

A detailed financial analysis is performed for each measure based on detailed implementation cost estimates, site-specific operating cost savings, and the customer's investment criteria. Sufficient detail is provided to justify project implementation. The evolution of cloud-based energy auditing software platforms is enabling the managers of commercial buildings to collaborate with general and specialty trades contractors in performing general and energy system audits. The benefit of software-enabled collaboration is the ability to identify the full range of energy efficiency options that may be applicable to the specific building.

### Following are the main process of an energy audit:

- Utility bills are collected for a 12- to 36-month period to evaluate the facility's energy demand rate structures and energy usage profiles.
- The analysis of building and utility data, including study of the installed equipment
- The survey of the real operating conditions
- The understanding of the building behavior and of the interactions with weather, occupancy and operating schedules;
- The selection and the evaluation of energy conservation measures (ECM's) selected to correct the defects or improve the existing installation.





# SOLAR PV PANNELS









# **Trina**solar

**VERTEX600W+MODULE VERTEX550W+MODULE** 



SMA











**SMA 3-6 KW SMA 8 & 10 KW** 

SMA 15-20 KW SMA 25 KW

**CORE 1 50 KW** 

**CORE 2 110 KW** 





**TIGER PRO 38TR MONOFACIAL** 535WP-580WP









SUNNY TRIPOWER



# **LONGI** Solar

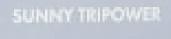
HI-MO5 BIFACIAL MODULS 530-545WP



SDT SERIES 4-10KW THREE PHASE 2 MPPT



SDT G2 SERIES 17-25KW THREE PHASE 2 MPPT





**SMT SERIES** 25-36KW THREE PHASE 3 MPPT



MT SERIES 50-80KW THREE PHASE 4 MPPT



HT SERIES 100-136KW THREE PHASE UP TO 12 MPPT



# HYBRID/BATTERY INVERTERS

# BATTERIES

# CONTROL & MONITORING



### **SMA SUNNY ICE LAND**

3.3 KW 4.6 KW 6.0 KW

### GOODWE

ET SERIES 5-10KW THREE PHASE STORAGE INVERTER HIGH VOLTAGE BATTERY

VIII

VICTRON ENERGY 3KVA TO 10KVA



SIRUS KILOWATT

3.3 KWH 7.1 KWH



# Solar charge controller



VICTRON ENERGY 1KW TO 5KW PV



**SMA HOME MANAGER 2.0** 



SMA DATA MANAGER M



COMAP INTELISYS NTC HYBRID



**VICTRON GX CONTROLLER** 





# CASE STUDIES

The **First Project** with SMA SUNNY BOY 2.5KW was installed and commissioned on 25th december, 2015 by R&R Engineering and still on working condition.



Ghufran-2.4KW

Rarachi, Pakistan

25/12/2015

24.0 KWP

approx. 4201 KWH

Approx. 3.1 tons per annum

Annual Saving in PKR: 50,130/-

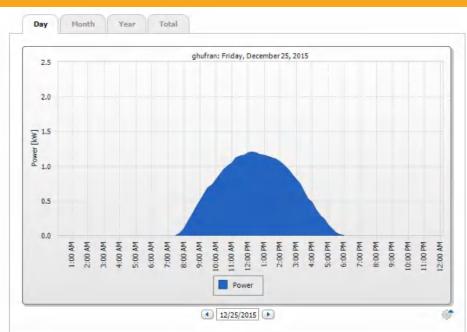
Modules: Canadian Solar

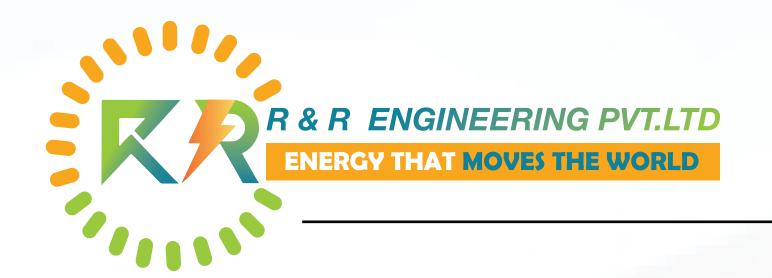
300W x 8 module

Communication: 1 x SMA

Webconnect,

Inverter: Sunny Boy 2.5 1VL-40





# RESIDENTIAL



Karachi, Pakistan





approx per anum 42,887 kWh

Approx. 30 tons per annum

Annual Saving in PKR: approx. 0.8 Millions

Modules: Trina Solar Energy 490W Cut Cell

Communication: 3 x SMA Webconnect, Inverter: Sunny Boy 2.5 1VL-40

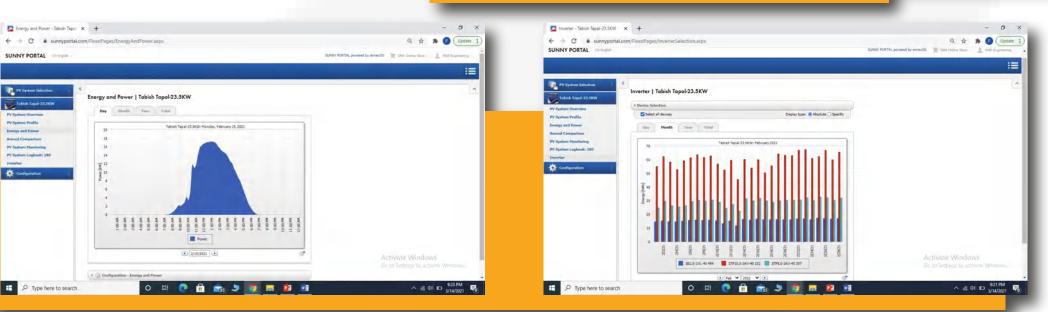
Sunny Tripower 10.0KW Sunny Tripower 5.0KW



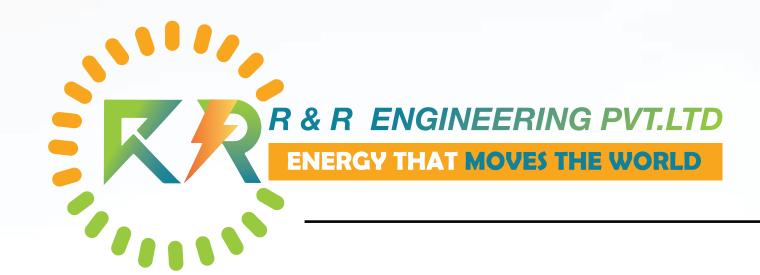












# NDUSTRIAL

- Artistic Fabric Mills
- Karachi, Pakistan
- **1/19/2021**
- 180 kWp
- approx per anum 318,500 kWh
- Approx. 227.5 tons per annum
- Annual Saving in PKR: approx. 5.25 Millions

Modules: Trina Solar Energy 490W Cut Cell

Inverters: 3 x SMA Sunny Tripower CORE1 50KW,

Communication: 3 x SMA Webconnect

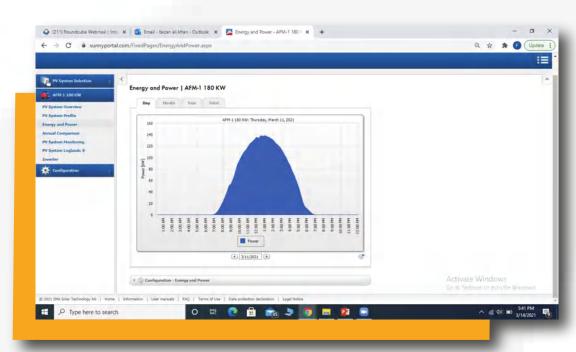
CO2 avoided approx. 1,954.6 tons per annum





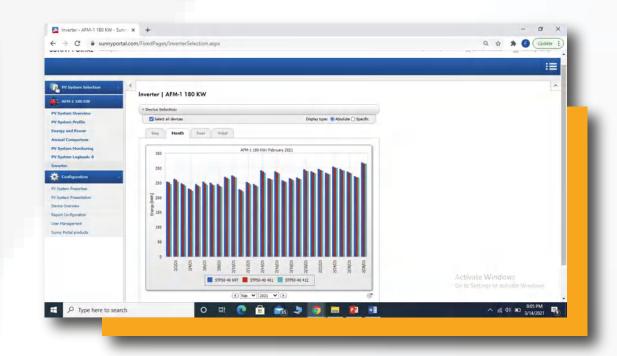














# RESIDENTIAL

- **Line State** Ubaid Hala
- Karachi, Pakistan
- **3/25/2021**
- 122.00kWp
- approx per anum 36,135 kWh
- Approx. 25.3 tons per annum
- Annual Saving in PKR: approx. 0.6Millions

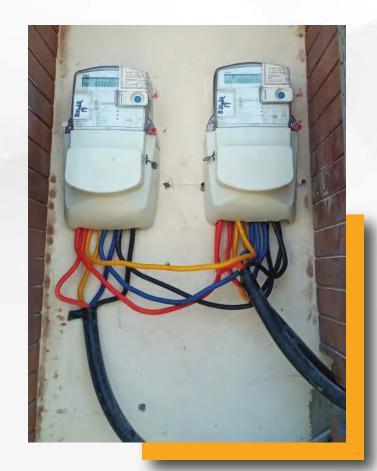
Modules: Trina Solar Energy 490W Cut Cell

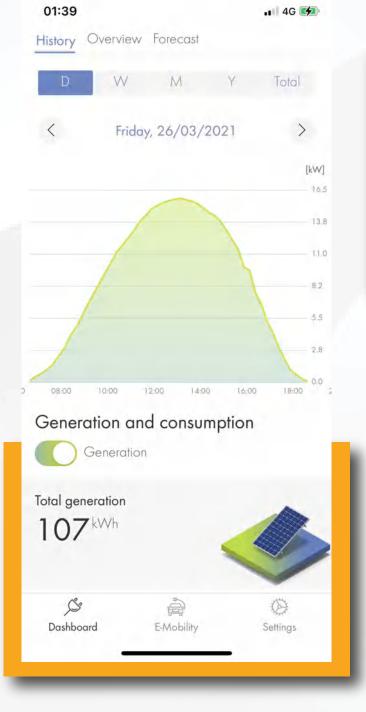
Communication: 2 x SMA Webconnect, Inverter:

CO2 avoided: Approx. 26.78 tons per annum

Sunny Tripower 10.0KW Sunny Tripower 6.0KW





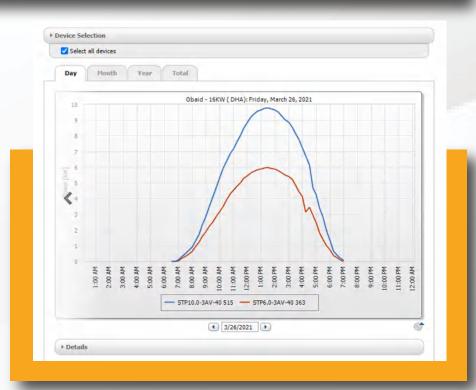
















# ON-GRID With ESS (Energy Storage System)

An Energy Storage System (ESS) is a specific type of power system that integrates a power grid connection with a Victron Inverter/Charger, GX device and battery system. It stores solar energy into your battery during the day, for use later on for self consumption and in the event of grid failure

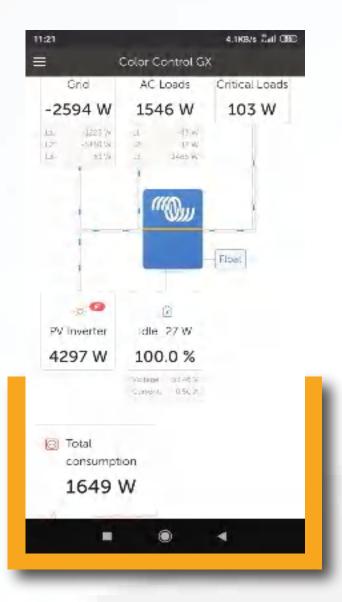
Salman Jamali - 6.5KW

Rarachi, Pakistan

5/14/2020

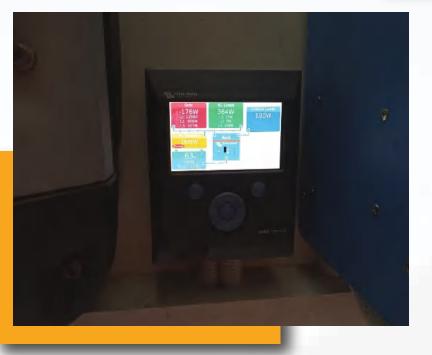
6.5KW Solar PV with 3.5KWH Storage

On Grid inverter = 6.5KW Victron Multiplus = 3Kva Victron Color Control GX & Smart meter Sirus Supercap = 3.5Kwh



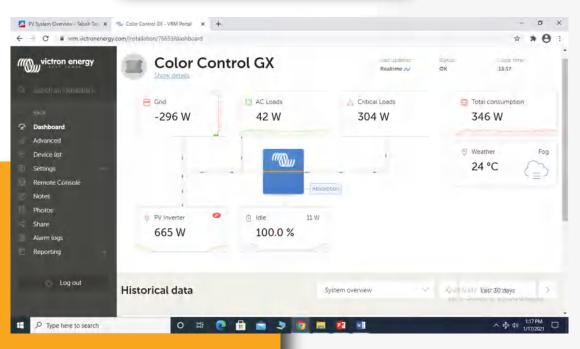
















# INTERNATIONAL PROJECTS - UK



Value of the second of the

10/8/2016



Approx per anum 2,847 KWh

Approx per anum GBP 512.46









Phayes, UK

8/10/2017

110KW Solar PV

Approx per anum 120,450 KWh

Approx per anum GBP 19,272











# SE OUR PROJECTS

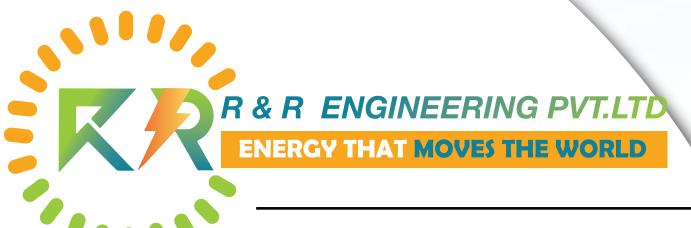














# On Grid Industrial

- ADM MILLS 120 KW
- Rarachi, Pakistan
- **14/6/2017**
- Approx per anum 197,100 KWh
- Approx per anum PKR 3,153,600

# On Grid Industrial

- Phizer 150 KW
- Karachi, Pakistan
- **3/11/2020**
- Approx per anum 246,375 KWh
- Approx per anum PKR 3,942,000

# On Grid Industrial

- AFM MILLS 800 KW
- Yarachi, Pakistan
- **16/2/2021**
- Approx per anum 1,134,000 KWh
- Approx per anum PKR 21,024,000

# On Grid Residential

- MR. Faisal Ahmed-12.5KW
- Karachi, Pakistan
- **14/5/2020**
- Approx per anum 20.5321 KWh
- Approx per anum PKR 328,500

# On Grid Commercial

- NEUPLEX 28 KW
- Karachi, Pakistan
- **12/10/2020**
- Approx per anum 45.990 KWh
- Approx per anum PKR 275,940

# On Grid Residential

- MR. Junaid 10.3 KW
- OHA 8, Karachi
- **16/5/2017**
- Approx per anum 16,217 KWh
- Approx per anum PKR 270,284

On Grid Residential

- MR. Ali Haider 6.2 KW
- PECHS ,Karachi
- **14/10/2021**
- Approx per anum 10,183 KWh
- Approx per anum PKR 162,936

# On Grid Commercial

- **UMDC 240 KW**
- Rarachi, Pakistan
- **12/10/2020**
- Approx per anum 394,200 KWh
- Approx per anum PKR 7,095,600

# Off Grid Commercial

- Govt. High School 15 KW 3 phase
- Khairpur, Sindh
- **20/4/2019**
- Approx per anum 24,660 KWh
- Approx per anum PKR 394,200



# On Grid Industrial

- **AFM Unit 1 180 KW**
- Yarachi, Pakistan
- **4/6/2020**
- Approx per anum 295,650 KWh
- Approx per anum PKR 4,730,400

# On Grid Industrial

- TAPAL Industries 25 KW
- Rarachi, Pakistan
- **14/6/2019**
- Approx per anum 41,062 KWh
- Approx per anum PKR 739,125

# On Grid Industrial

- Abid Paper Industries 15 KW
- Karachi, Pakistan
- **21/5/2018**
- Approx per anum 24,635 KWh
- Approx per anum PKR 443,475

# On Grid Residential

- MR Najeeb 10 KW
- **28/5/2018**
- Approx per anum 16,425 KWh
- Approx per anum PKR 295,250

# On Grid Residential

- DR Raza 12 KW
- Karachi, Pakistan
- **5/7/2018**
- Approx per anum 20,5321 KWh
- Approx per anum PKR 328,500

# On Grid Residential

- MR Irfan 5 KW
- **V** Karachi, Pakistan
- **14/5/2018**
- Approx per anum 82,12 KWh
- Approx per anum PKR 147,825

# On Grid Commercial

- **CNDC Laboratory 120 KW**
- **4/10/2021**
- Approx per anum 45,990 KWh
- Approx per anum PKR 275,940

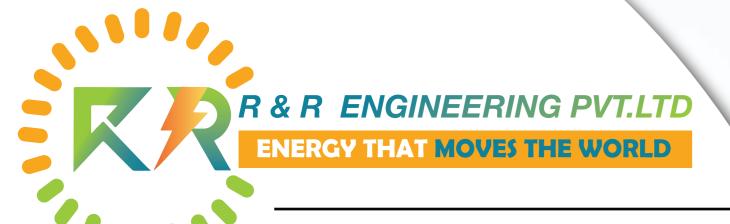
# On Grid Commercial

- Abu Hamza PVC 80 KW
- Karachi, Pakistan
- **8/9/2020**
- Approx per anum 131,400 KWh
- Approx per anum PKR 2,365,200

# On Grid Commercial

- Tahir & Sons 28 KW
- **11/3/2019**
- Approx per anum 45,990 KWh
- Approx per anum PKR 275,940







## On Grid Residential

- DR Shakil 10 KW
- **8/5/2019**
- Approx per anum 16,425 KWh
- Approx per anum PKR 295,250

# On Grid Residential

- DR Bilal 10.5 KW
- Karachi, Pakistan
- **1** 21/2/2018
- Approx per anum 17,425 KWh
- Approx per anum PKR 320,250

# On Grid Residential

- MR Ali 6.6 KW
- **28/5/2018**
- Approx per anum 12,425 KWh
- Approx per anum PKR 220,250

# On Grid Residential

- iii MR. Iqbal Ahmed 11.5KW
- Rarachi, Pakistan
- **5** 25/9/2020
- Approx per anum 18,5321 KWh
- Approx per anum PKR 305,500

# On Grid Commercial

- MR Mustafa 50 KW
- Karachi, Pakistan
- **12/2/2021**
- Approx per anum 82,125 KWh
- Approx per anum PKR 1,478,250

## On Grid Residential

- MR. Ansar 20 KW
- OHA 8, Karachi
- **18/7/2017**
- Approx per anum 32,850 KWh
- Approx per anum PKR 525,600

# On Grid Commercial

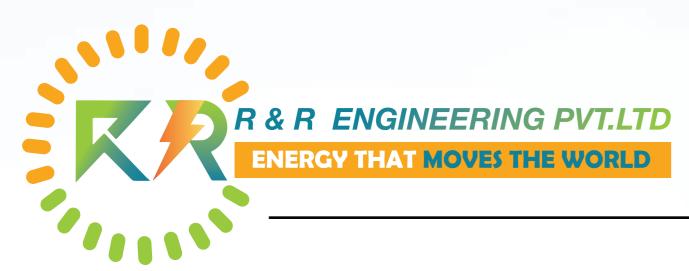
- MS Engineering 15 KW
- Yarachi, Pakistan
- **10/1/2021**
- Approx per anum 24,660 KWh
- Approx per anum PKR 394,200

# On Grid Residential

- MR. Abbas 5 KW
- 💡 Fadia ,Karachi
- **10/4/2021**
- Approx per anum 8,212 KWh
- Approx per anum PKR 147,825

# Off Grid Commercial

- MR Adil 3 KW single phase
- PECHS, Karachi
- **5/11/2019**
- Approx per anum 4,297 KWh
- Approx per anum PKR 8,695







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