

Rainbow Power Company

Empowering Resilient Communities Through Sustainable Energy

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- 02** Types of Systems
- 03** System Components
- 04** Solar vs Alternatives
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- 07** Rainbow Power's Role

01 How Photovoltaic (PV) Solar Works

01 How Solar Works

01

Light
Absorption

01 How Solar Works

01

Light
Absorption

02

Electron
Excitation

01 How Solar Works

01

Light
Absorption

02

Electron
Excitation

03

Direct Current
(DC)
Generation

01 How Solar Works

01

Light
Absorption

02

Electron
Excitation

03

Direct Current
(DC)
Generation

04

Conversion to
Alternating
Current (AC)

01 How Solar Works

01

Light
Absorption

02

Electron
Excitation

03

Direct Current
(DC)
Generation

04

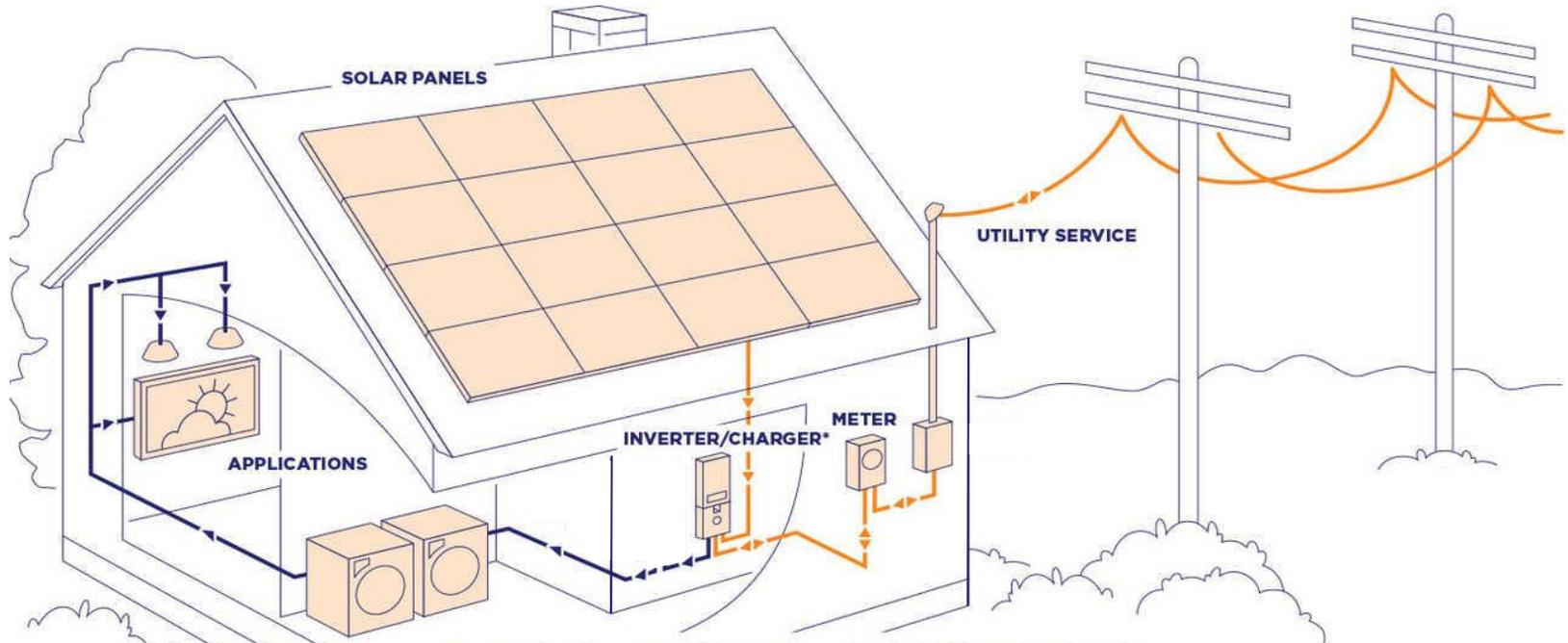
Conversion to
Alternating
Current (AC)

Core Concept

Sunlight
+
PV Cell
=
Electricity

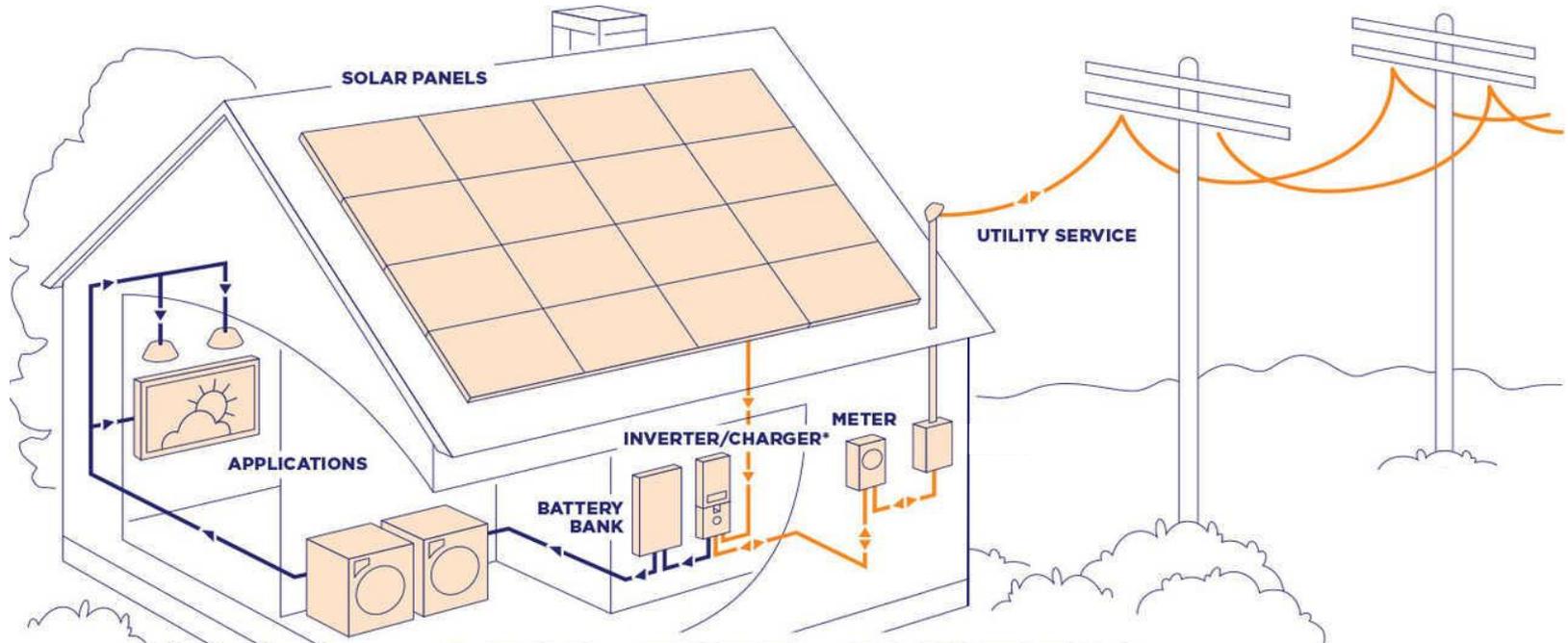
02 Types of Solar Systems

02 Types of Systems



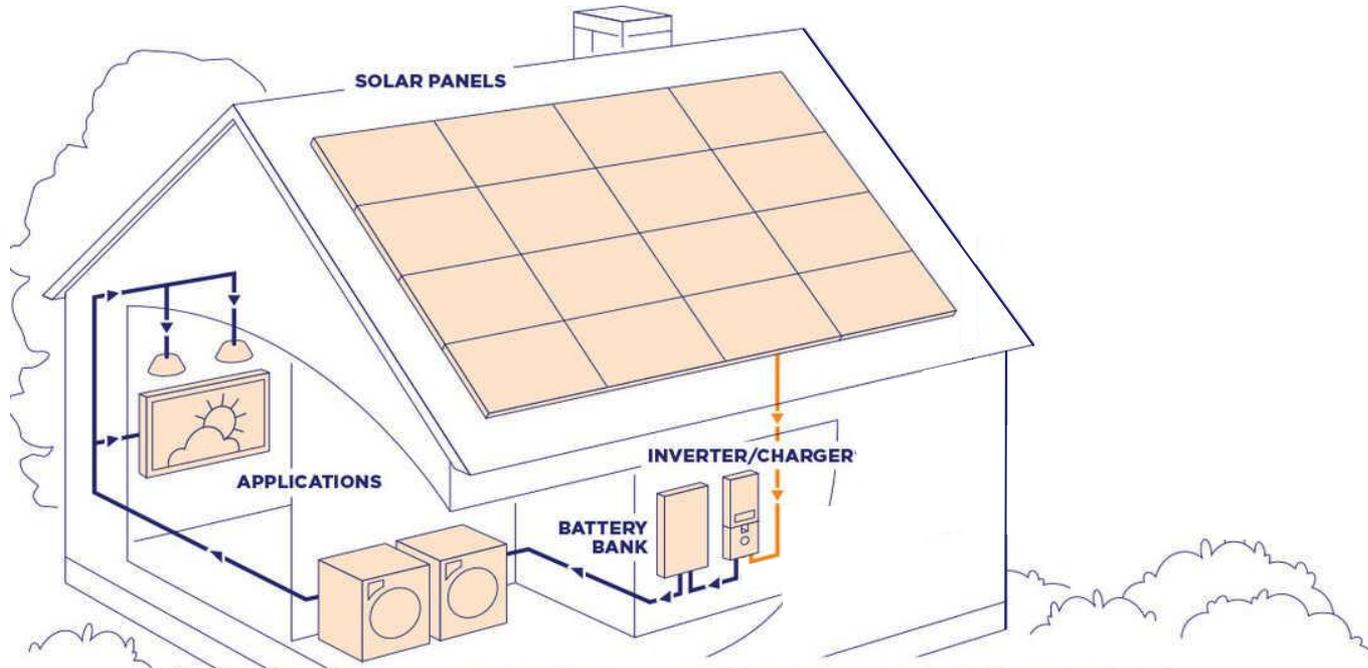
Grid-Tied (PV-only)

02 Types of Systems



Hybrid System (On-grid)

02 Types of Systems



Off-grid System

03 Major System Components

03 Major System Components

01

PV Panels

02

Inverter

03

Battery

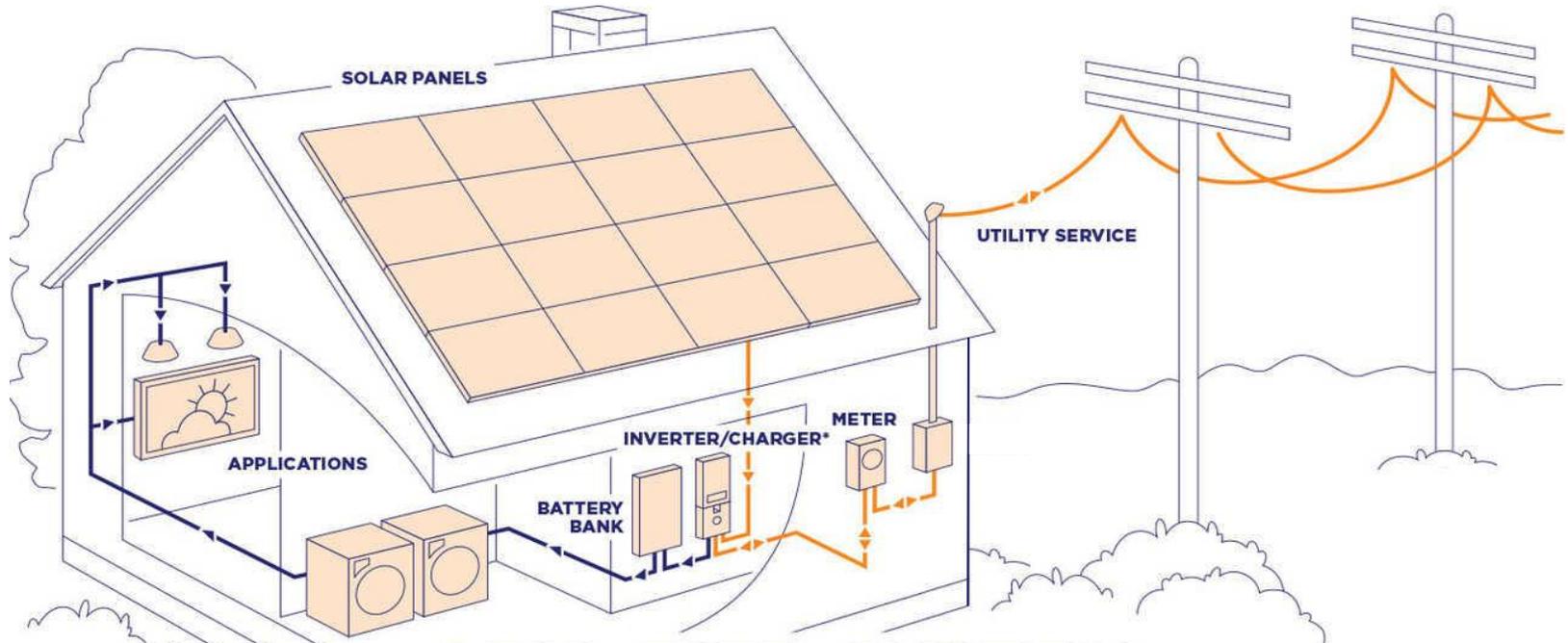
04

Charge
Controller

05

Monitoring
System

03 Major System Components



04 Solar vs Alternative Energy Sources

Criteria	Solar Power	Wind Energy	Hydropower	Natural Gas	Grid Electricity
Source	Sunlight	Wind	Flowing water	Fossil fuel	Fossil fuel
Renewability	Infinite	Infinite	Finite (site-limited)	Non-renewable	Non-renewable
Environmental Impact	Minimal emissions	Minimal emissions, some noise	Ecosystem disruption from dams	Methane and CO2 emissions	CO2 emissions
Reliability	Intermittent (sunny days required)	Intermittent (wind required)	High	Very high	Very high
Installation Cost	Medium	High	Very high	Low-medium	Low
Operating Cost	Very low	Low	Medium	High (fuel)	High
Best Suited For	Urban/rural rooftops/fields	Open, windy areas	Large water resources	Existing gas networks	Existing grid networks
Circular Economy	Medium	Low	Low	Low	Low

05 Evolving Goals of Solar Design

05 Evolving Solar Goals

Yesterday:

What's the biggest system I can afford?

05 Evolving Solar Goals

Yesterday:

What's the biggest system I can afford?

Today:

How can I become energy independent?

06 What is Energy Resilience?

06 Energy Resilience



During the Northern Rivers floods, a local panel beater with solar and Starlink became a lifeline for residents

06 Energy Resilience



“These systems ensure our fire trucks remains operational during extended power outages”

Ken Wallis
Blue Knob RFS

06 Energy Resilience



The Nimbin Showgrounds, powered by a 50 kW solar-battery system, now serves as the official evacuation centre for Nimbin

06 Energy Resilience

Powering Community Hubs

Local halls, showgrounds, and SES bases are critical community assets

07 Rainbow Power's Role

07 Rainbow Power's Role



**Rainbow Power
acts as an
emergency hub
for the SES during
local disasters**

07 Rainbow Power's Role

How do we foster energy resilience?
Resilient Power = Resilient Communities

QA