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Hybrid 3-phase inverters – double safety

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Technical Support Team, Solplanet

Solplanet ASW8-10-12KH-T1 Hybrid Inverters

Agenda

1. Mounting
2. Technical data and compatible energy banks
3. Connecting hybrid inverter
4. Working modes
5. Success cases

1. Mounting

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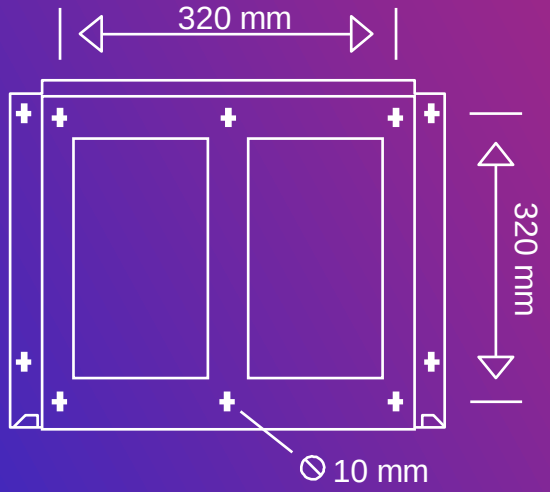
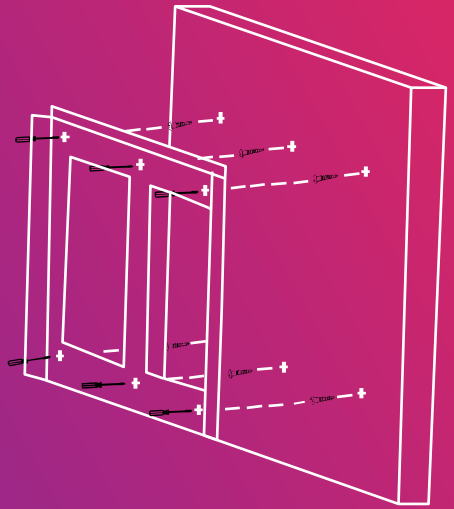
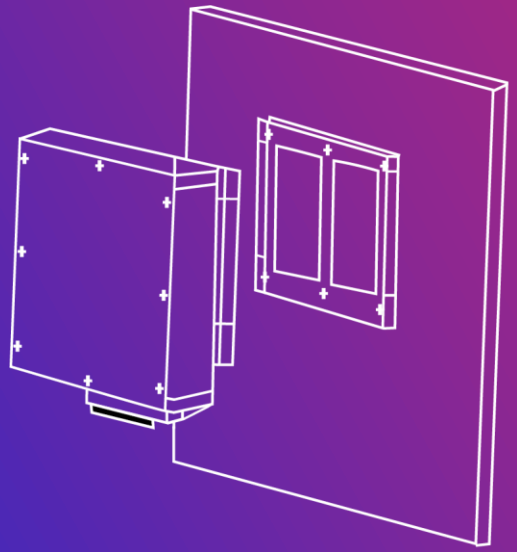
Installation guide

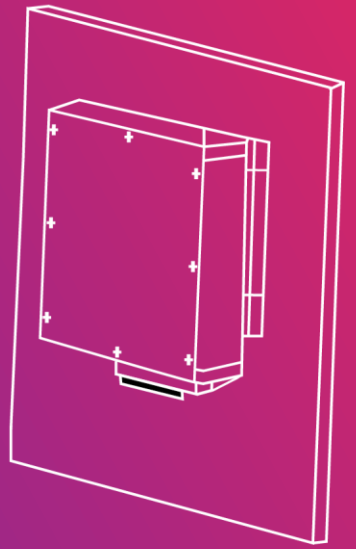




Screw the wall bracket on the wall

Installation guide





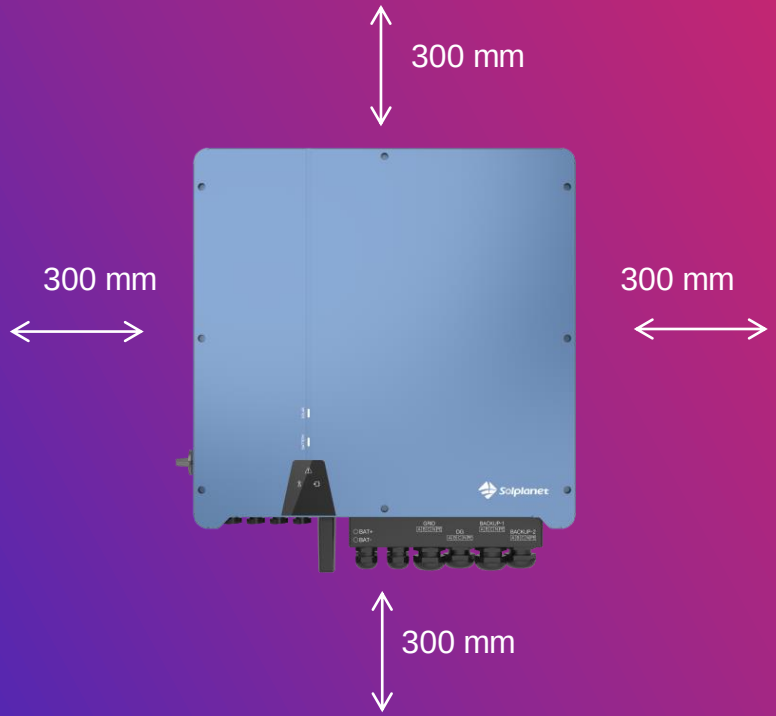
Place the inverter on the wall mounted bracket by holding the handle on the side

Installation guide

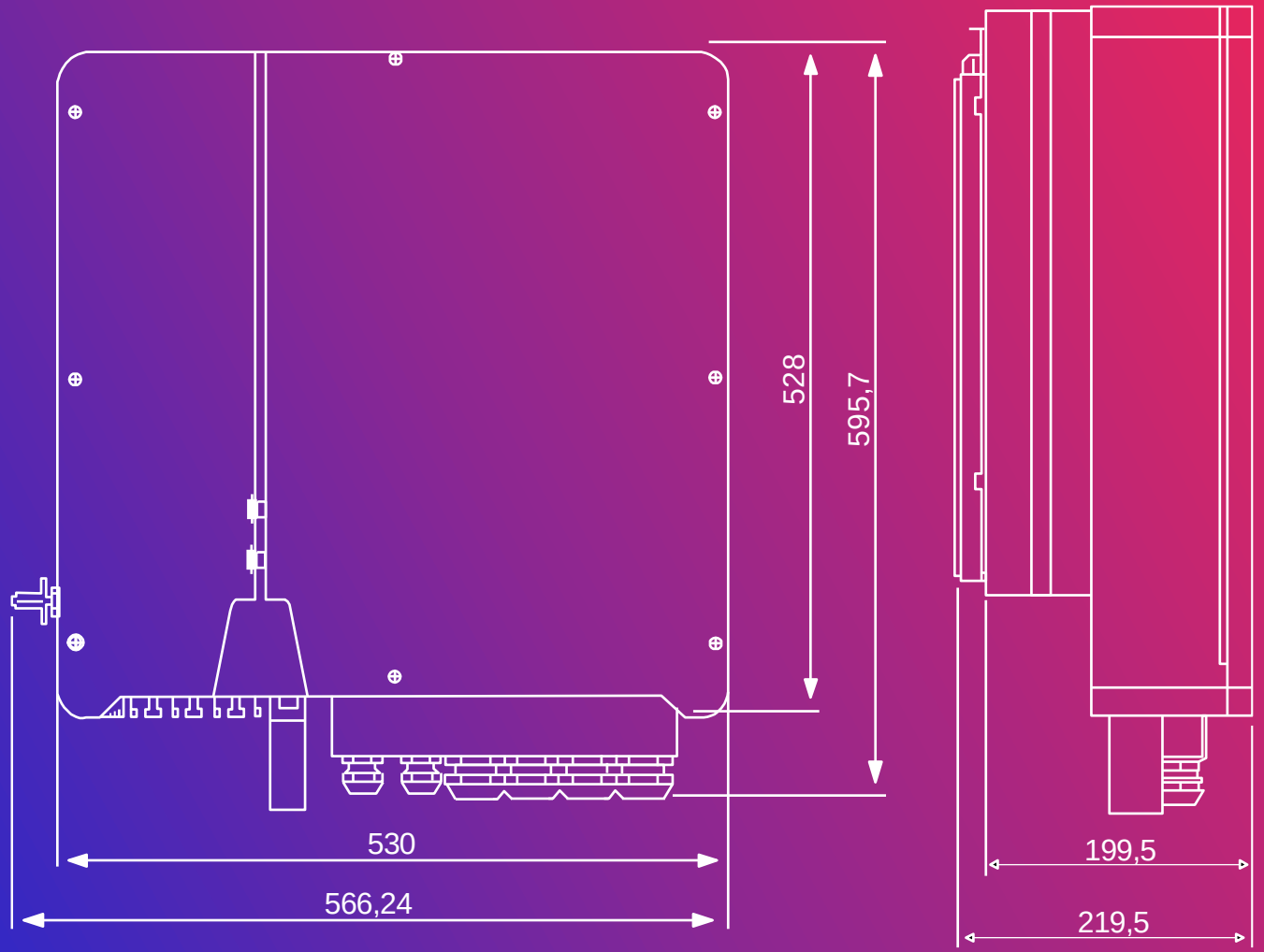
Please AVOID direct sunlight, rain exposure, snow laying up during installation and operation

No direct sunlight | No rain exposure | No snow lay up | Direct sunlight | Rain exposure | Snow lay up

Installation guide



2. Technical data and compatible energy banks


528
595,7
530
566,24
199,5
219,5

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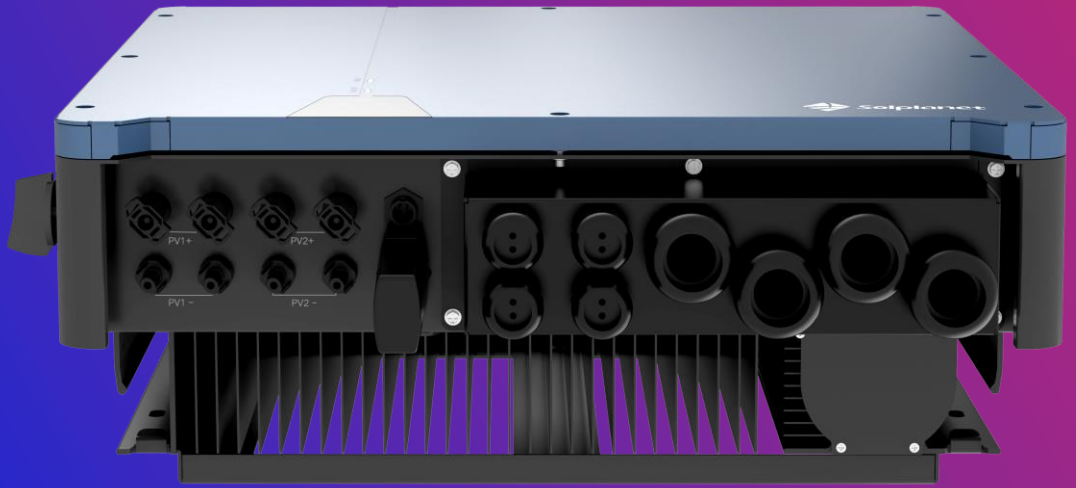
Solplanet
BAT+
BAT-
GRID
DO
BACKUP-1
BACKUP-2

Solplanet
BAT+
BAT-
GRID
DO
BACKUP-1
BACKUP-2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PV1+
PV2+
PV1 -
PV2 -

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Technical DataSheet		ASW8KH-T1	ASW10KH-T1	ASW12KH-T1
PV input	Max. PV array power	12 kWp STC	15 kWp STC	18 kWp STC
	Max. input voltage	1000 V		
	MPP voltage range	180 V - 850 V		
	Min. input voltage / start voltage	125 V / 180 V		
	No. of independet MPPT trackers / strings per MPPT input	2 / (1/1)		
	Max. input current per MPP tracker	13 A		
	Max. short-circuit current per MPP tracker	25 A		
Battery input	Battery type	LiFePO4		
	Battery voltage range	125 V do 600 V		
	Max. charging / discharging power	8.8 kW / 8 kW	11 kW / 11 kW	13.2 kW / 13.2 kW
	Max. charging current / discharging current	50 A / 50 A		
	Rated. charging current / discharging current	40 A / 40 A		
AC output	Nominal AC voltage	3 W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V		
	AC voltage range	360 V - 440 V		
	Rated AC grid frequency	50 Hz / 60 Hz		
	AC grid frequency range	50 Hz±5 Hz / 60 Hz±5 Hz		
	Rated active power	8 kW	10 kW	12 kW
	Rated apparent power	8 kVA	10 kVA	12 kVA
	Max. apparent power	8,8 kVA	11 kVA	13,2 kVA
	Rated gird output Current (@400V)	11.6 A	14.5 A	17.4 A
	Max. gird output current	12.7 A	15.9 A	19.1 A
	Harmonics THDi (@ Nominal power)	< 3%		

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Technical DataSheet		ASW8KH-T1	ASW10KH-T1	ASW12KH-T1
AC input	Rated grid voltagge	3 W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V		
	Rated grid frequency	50 Hz / 60 Hz		
	Rated apparent power	16 kW / 17.6 kVA	20 kW / 22 kVA	24 kW / 26.4 kVA
	Rated apparent power from grid/ /Max. input current from grid	23.1 A / 25.5 A	28.9 A / 31.8 A	34.7 A / 38.2 A
EPS output	Nominal output voltage	3 W+N+PE, 220 / 380 V; 230 / 400 V; 240 / 415 V		
	Nominal output voltage	50 Hz / 60 Hz		
	Rated apparent power/ /Max. output apparent power	8 kVA / 8 kVA	10 kVA/ 10 kVA	12 kVA / 12 kVA
	Peak output apparent power	8,8 kVA	11 kVA	13,2 kVA
	Rated Current (@400V)	11,6 A	14,5 A	17,4 A
	Max. output current	12,7 A	15,9 A	19,1 A
	Max. switch time	≤20 ms		
	Output THDi (@ Linear load)	<2%		

Compatible energy banks

(for the moment):

- ✓ Pylontech Force H1 and H2
- ✓ Dyness Tower series: T10, T14, T17
- ✓ Lithium Valley LV-BST-H2.56Aa
- ✓ Own Solplanet - 2023
- ✓ The more in the future …..

(Note: inverter FW needs to be updated)

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High Voltage Force H1-H2 Series

PYLONTECH

FORCE SERIES

High Voltage Storage System

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Technical DataSheet	**Force H1 (336V74AH)**	**Force H2 (384V37AH)**
Battery module name	FH40874	FH9637M
Battery module voltage (Vdc)	48	96
Battery module capacity (AH)	74	37
Battery module quantity (Pcs)	3~7 Pcs	2~4 Pcs
Battery system capacity (kWh)	24.86	14.21
Battery system voltage (V)	336	384
Dimension (W*D*H mm)	600*380*1380	450*296*1415
Weight (kg)	259	155
Depth of discharge	90%	90%
Charge & discharge current (continous/max. A)	37/40	18.5/40
Comunication	CAN.Modbus	CAN.Modbus
Protection Class	IP55	IP55
Working temperature (*C)	0-50	0-50
Storage temperature (*C)	-20-60	-20-60
Warranty	15+years (25*C/775F)	15+years (25*C/775F)
Product certificate	UL/IEMC62619/IEC62477/IEC62040/CE/UN38.3	UL/IEMC62619/IEC62477/IEC62040/CE/UN38.3

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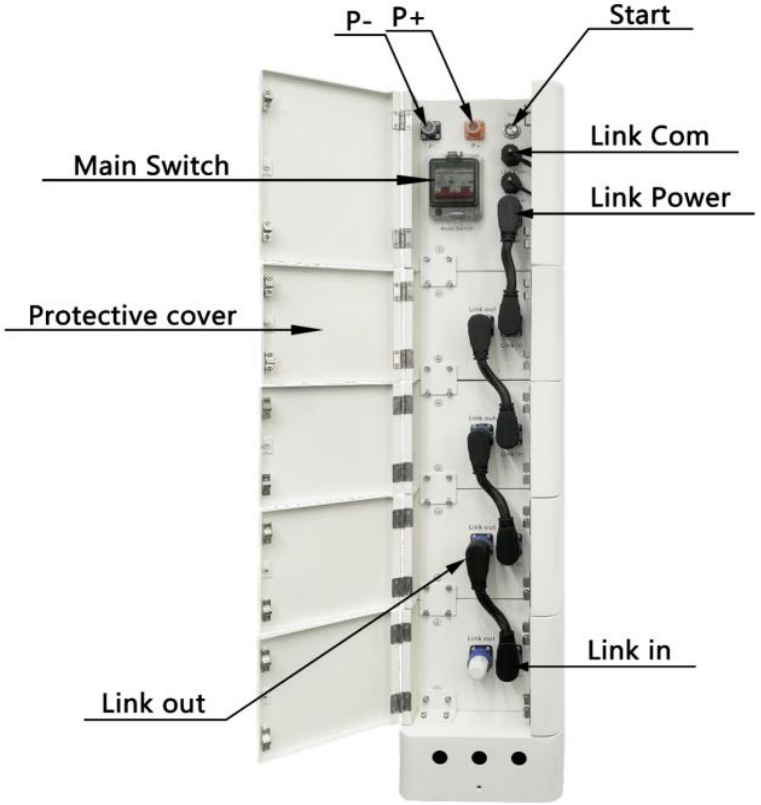
Model	Tower T10	Tower T14	Tower T17
Usable energy	10.65KWh	14.20KWh	17.76KWh
Nominal Capacity	37Ah	37Ah	37Ah
Nominal Voltage	288V	384V	480V
Maximum Continous Discharge Power	10KW	14KW	17KW
Maximum Continous Charge Power	10KW	14KW	17KW
Net Weight	149kg	192kg	235kg
Dimension (W*D*H)	800*510*510 mm	988*510*510 mm	1175*510*510 mm
Protection Level	IP65	IP65	IP65
Catendar Life	6000 Cycles	6000 Cycles	6000 Cycles
Charging Temperature Range	0~45*C	0~45*C	0~45*C
Discharging Temperature Range	-10~45*C	-10~45*C	-10~45*C
Intemal Battery Module	T9637	T9637	T9637
Module Connetion	Series	Series	Series
Module Number	3	4	5
Communication	CAN	CAN	CAN
Warranty	10 Years	10 Years	10 Years

Lithium Valley LV-BST-H2.56Aa High-voltage battery storage system



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Lithium Valley

Technical Specification

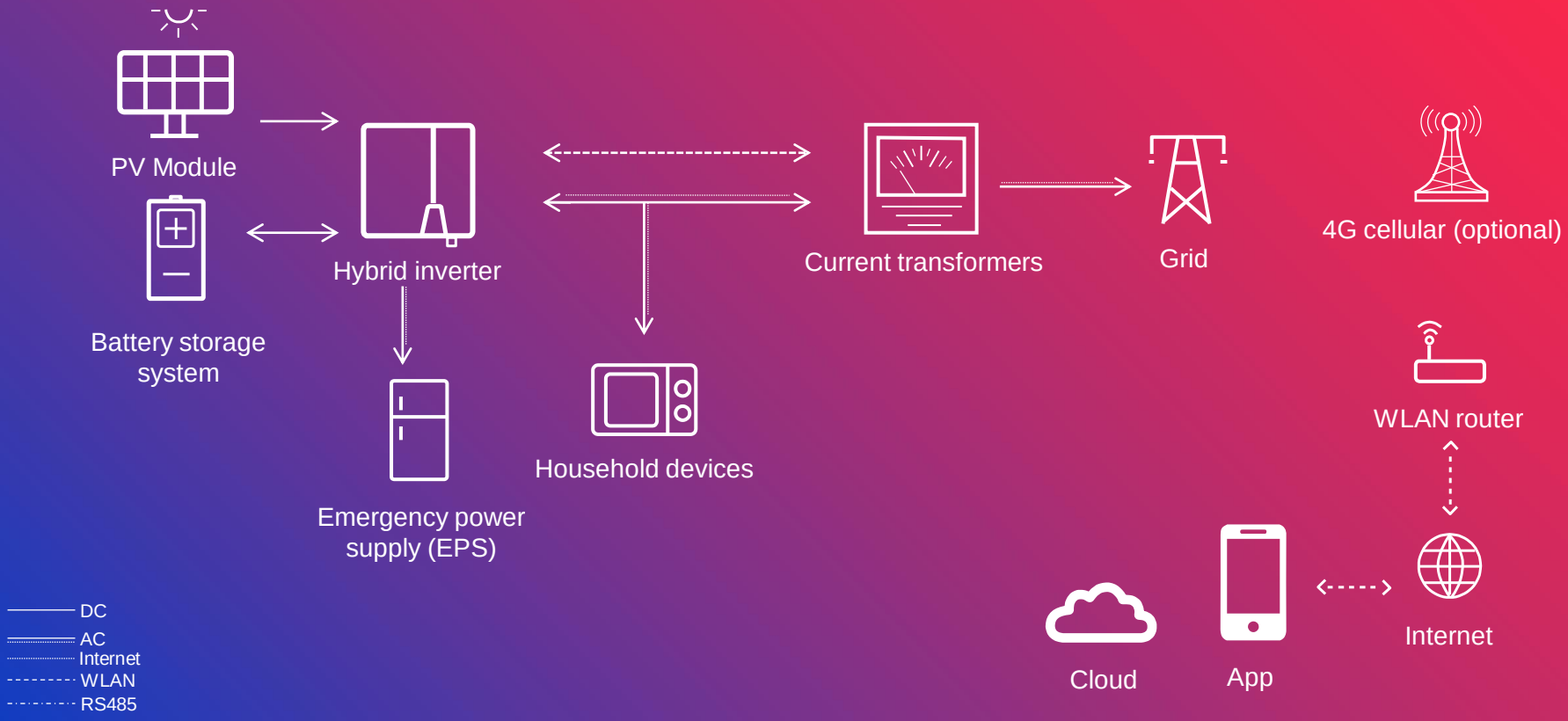
Model	153.6V 50Ah	204.8V 50Ah	256V 50Ah	307.2V 50Ah	358.4V 50Ah	409.6V 50Ah	460.8V 50Ah	512V 50Ah
Number of layers	3 layers	4 layers	5 layers	6 layers	7 layers	8 layers	9layers	10layers
Picture								
Energy	7.68KWh	10.24KWh	12.8KWh	15.36KWh	17.92KWh	20.48KWh	24.04KWh	25.6KWh
Operating Voltage Range	129.6V~168. 48V	172.8V~224.64V	216V~280.8V	259.2V~336.96V	302.4V~393.12V	345.6~449.28V	388.8V~505.44V	432V~561.6V
Dimension (L*W*H)	600*210*820	600*210*980	600*210*1140	600*210*1300	600*210*1460	600*210*1620	600*210*1780	600*210*1940
Net Weight	102.5	129	155.5	182	208.5	235	261.5	288
Recommend charge current	10~25A							
Max continue charge current	50A							
Max continue discharge current	50A							
Peak current	100A							
Display	The information of Battery, such as SOC, battery voltage and so on							
Communication	Support RS485 / CAN							
Operating temperature	-20℃~55℃							
Environment	Indoor							
Relative humidity	5%~95%							
Cooling	Natural convection							
Cell technology	Lithium-iron phosphate (LiFePO4)							
Life cycle	3500 times @80%DOD							

Single module Technical Specification

Dimension (L*W*H)	High Voltage Box:600*210*250 Battery Box:600*210*160
Battery module weight	26.5kg
Picture	

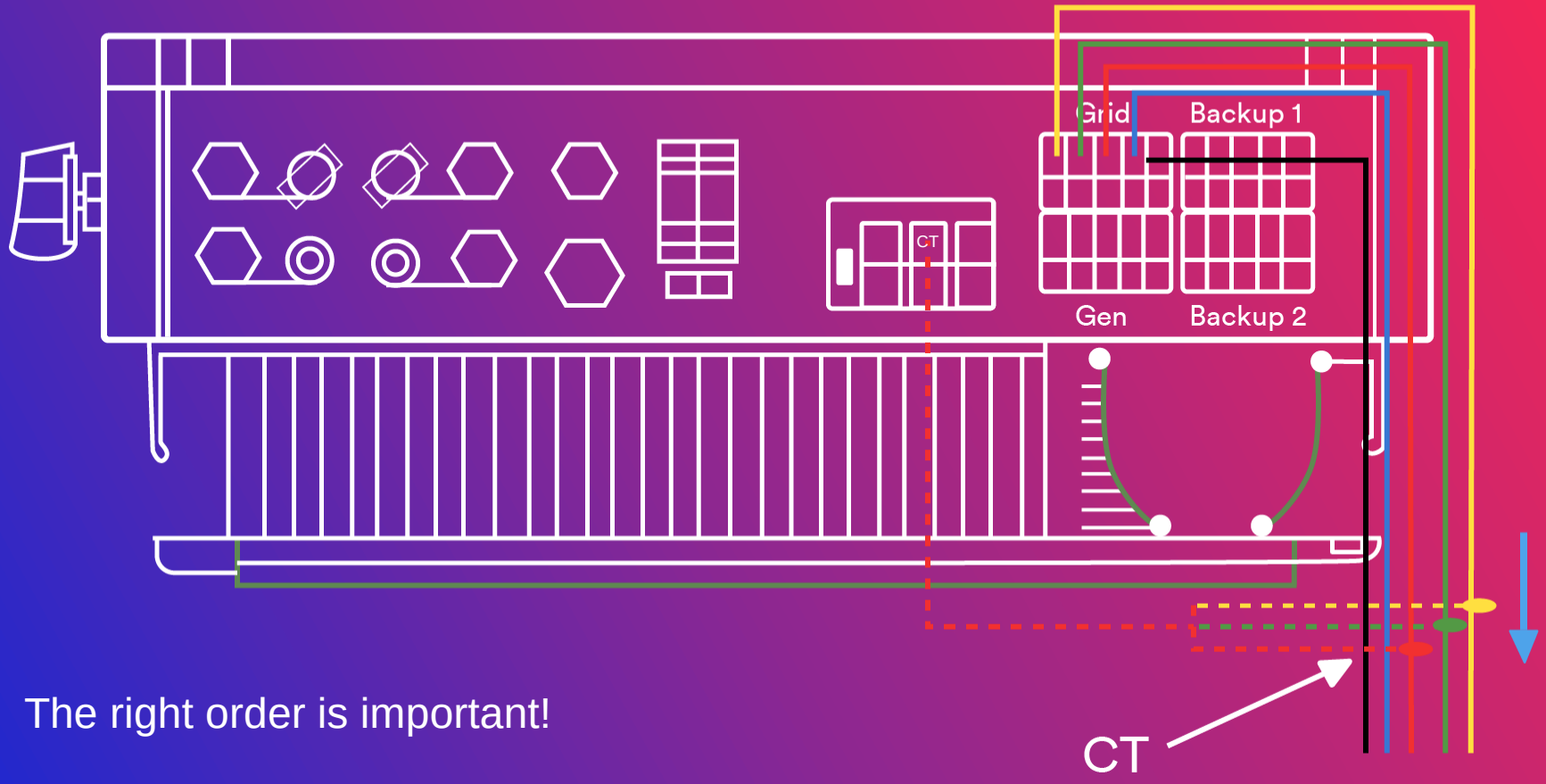
3. Connection of hybrid inverter

The diagram shows a hybrid PV installation



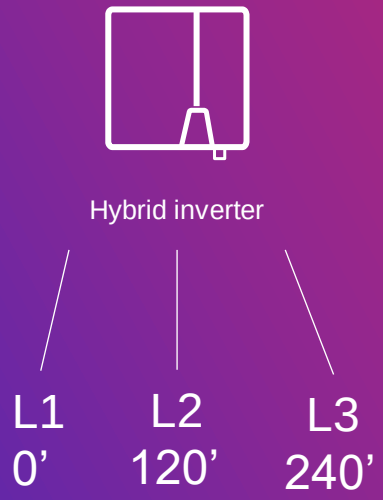
Terminals of PV inverter

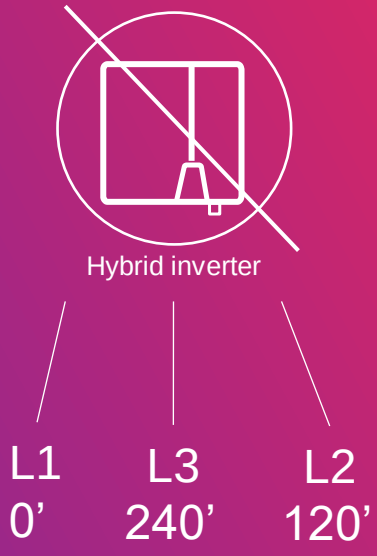
Terminals of PV inverter



The right order is important!

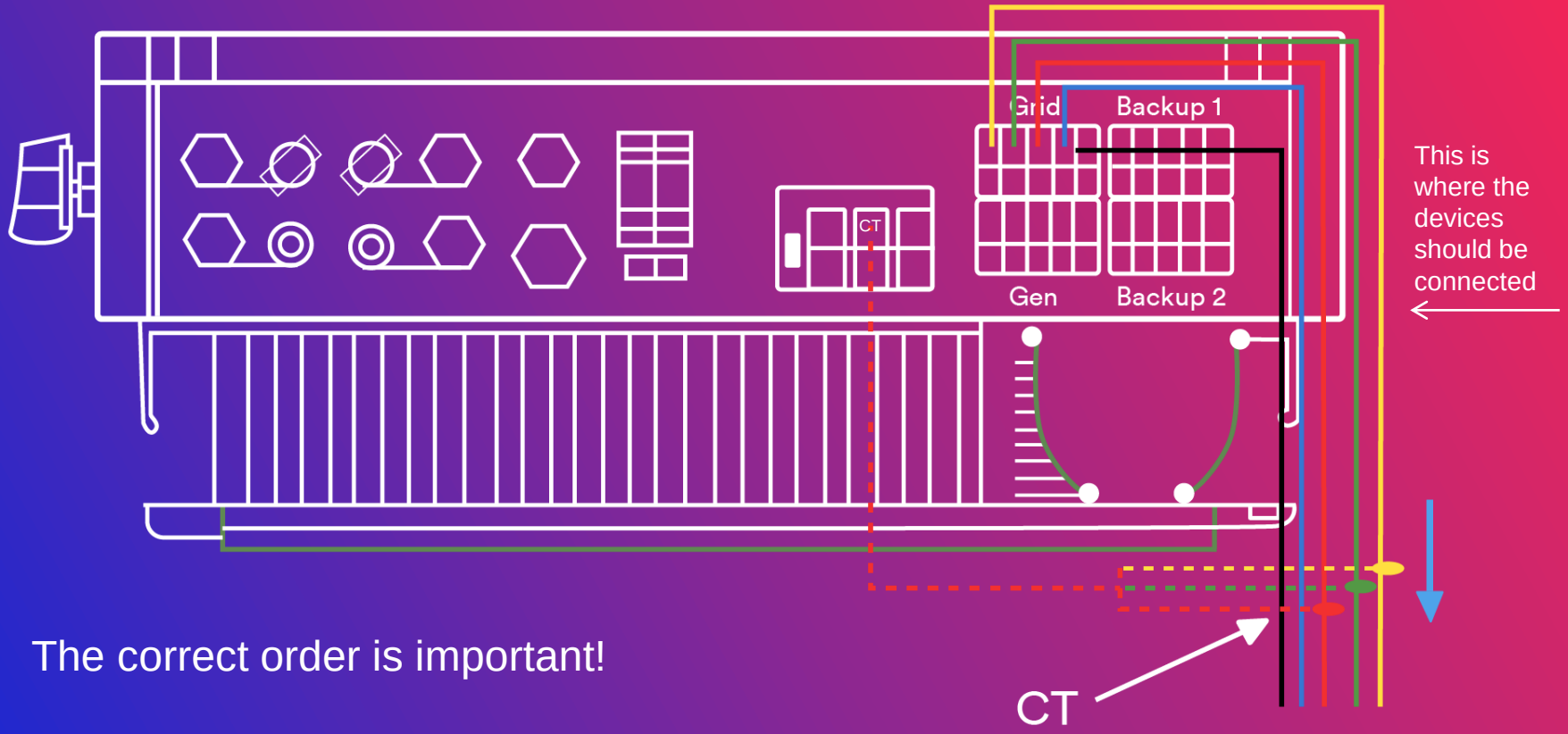
When connection, the direction of rotation of the phases is important





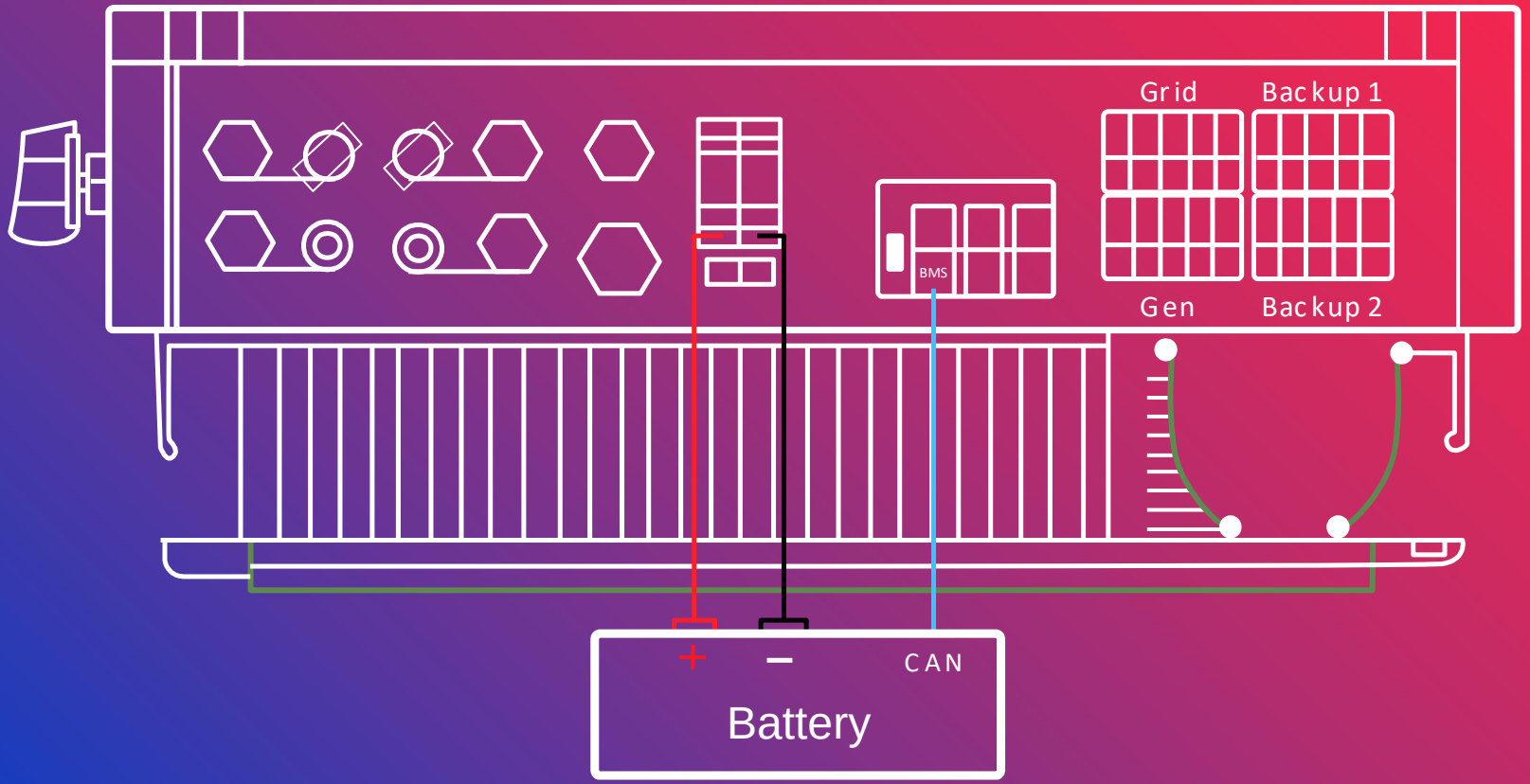
In the case of phase reversal,
the inverter will not interact with the grid
(but will charge the battery)

Terminals of PV inverter



The correct order is important!

Battery connection

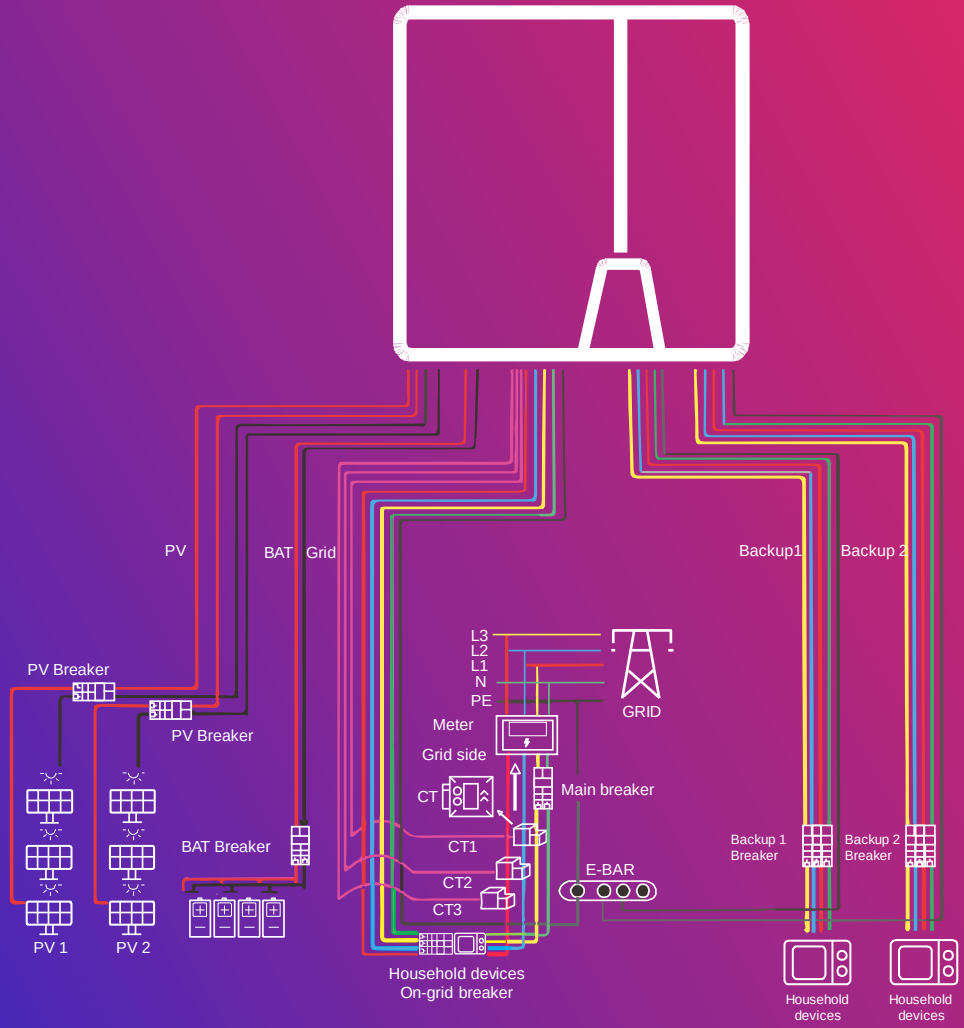


In some cases, the order in which energy sources are connected is important.

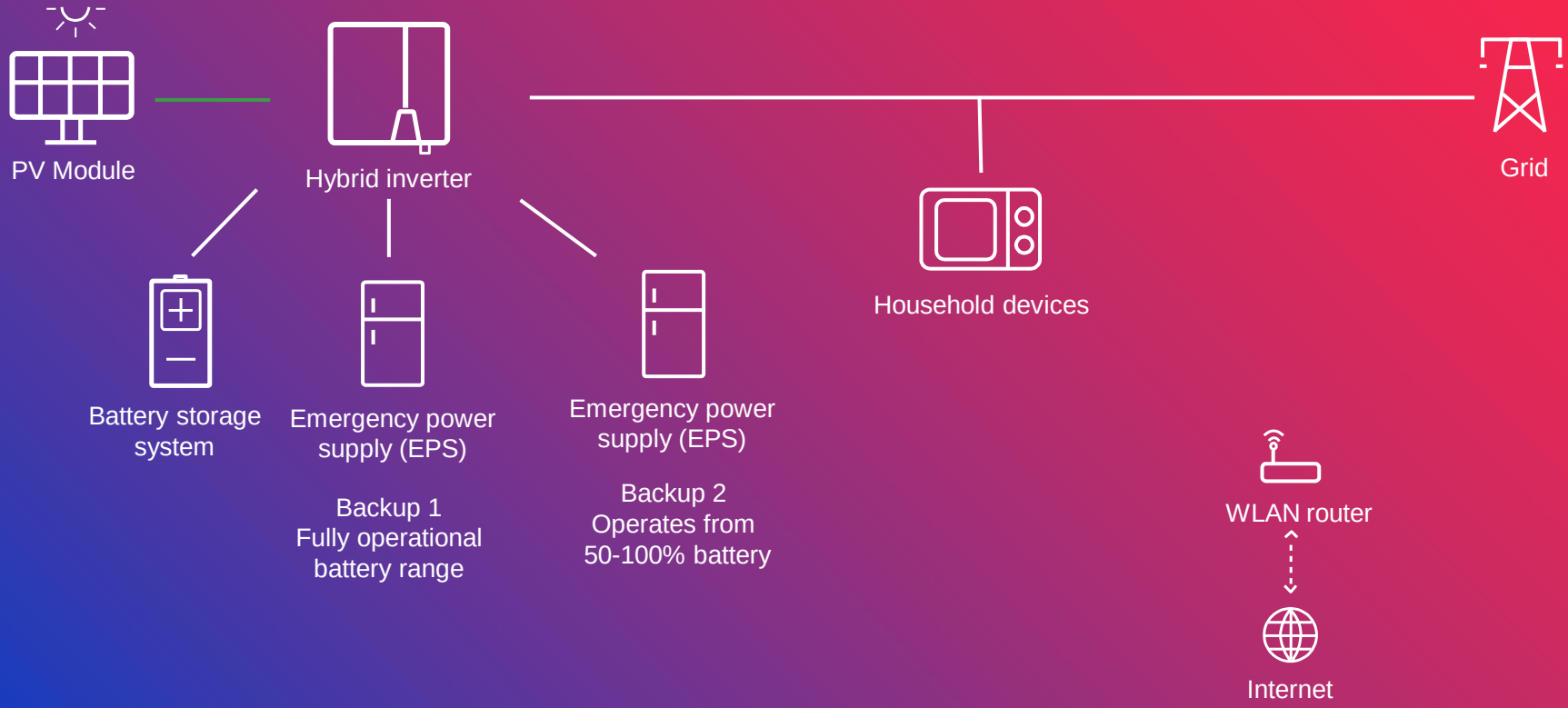
The correct sequence is:

- energy bank (after switch on, wait about a minute for the inverter to start up)
- AC breaker and Backup
- DC switch

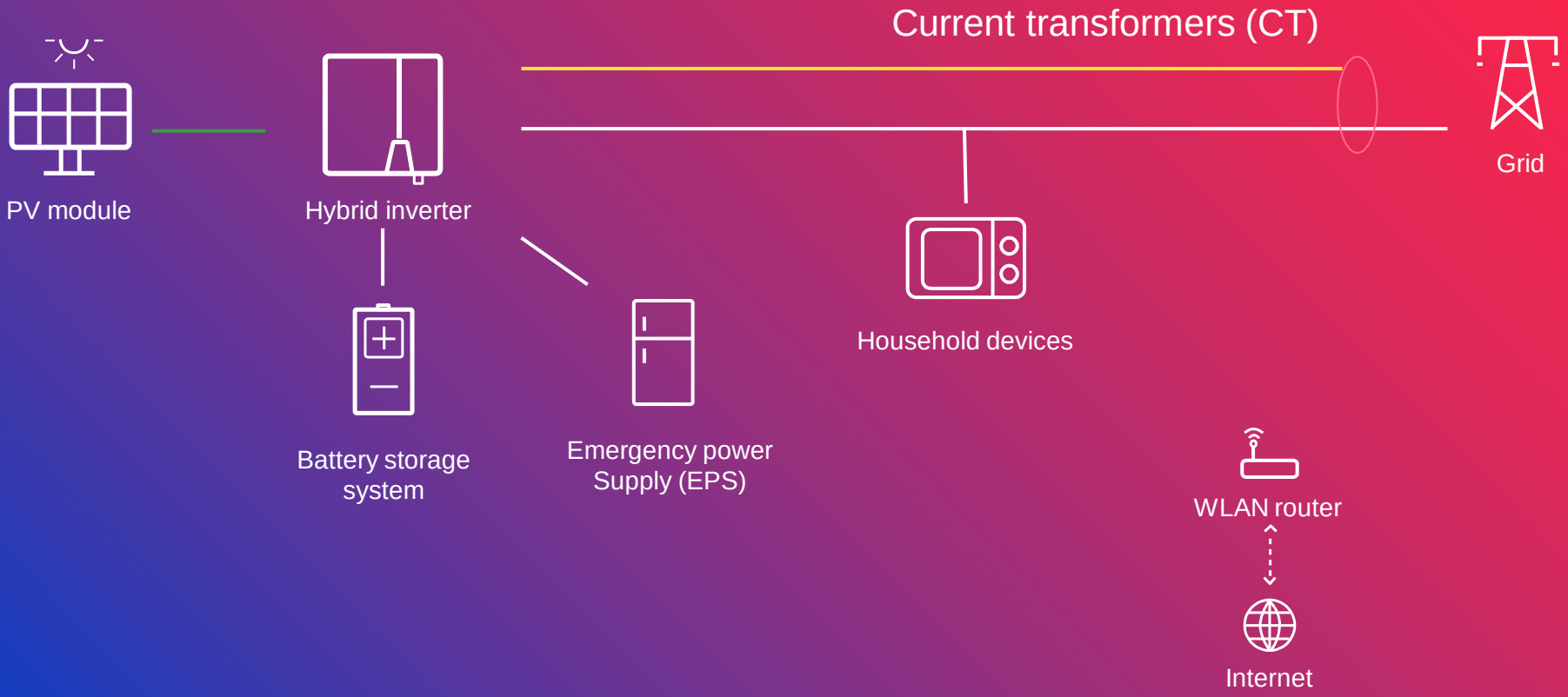
After this, it will should work properly.


PV
BAT
Grid
Backup1
Backup 2
PV Breaker
PV Breaker
L3
L2
L1
N
PE
GRID
Meter
Grid side
CT
Main breaker
BAT Breaker
CT1
CT2
CT3
E-BAR
Backup 1 Breaker
Backup 2 Breaker
PV 1
PV 2
Household devices
On-grid breaker
Household devices
Household devices

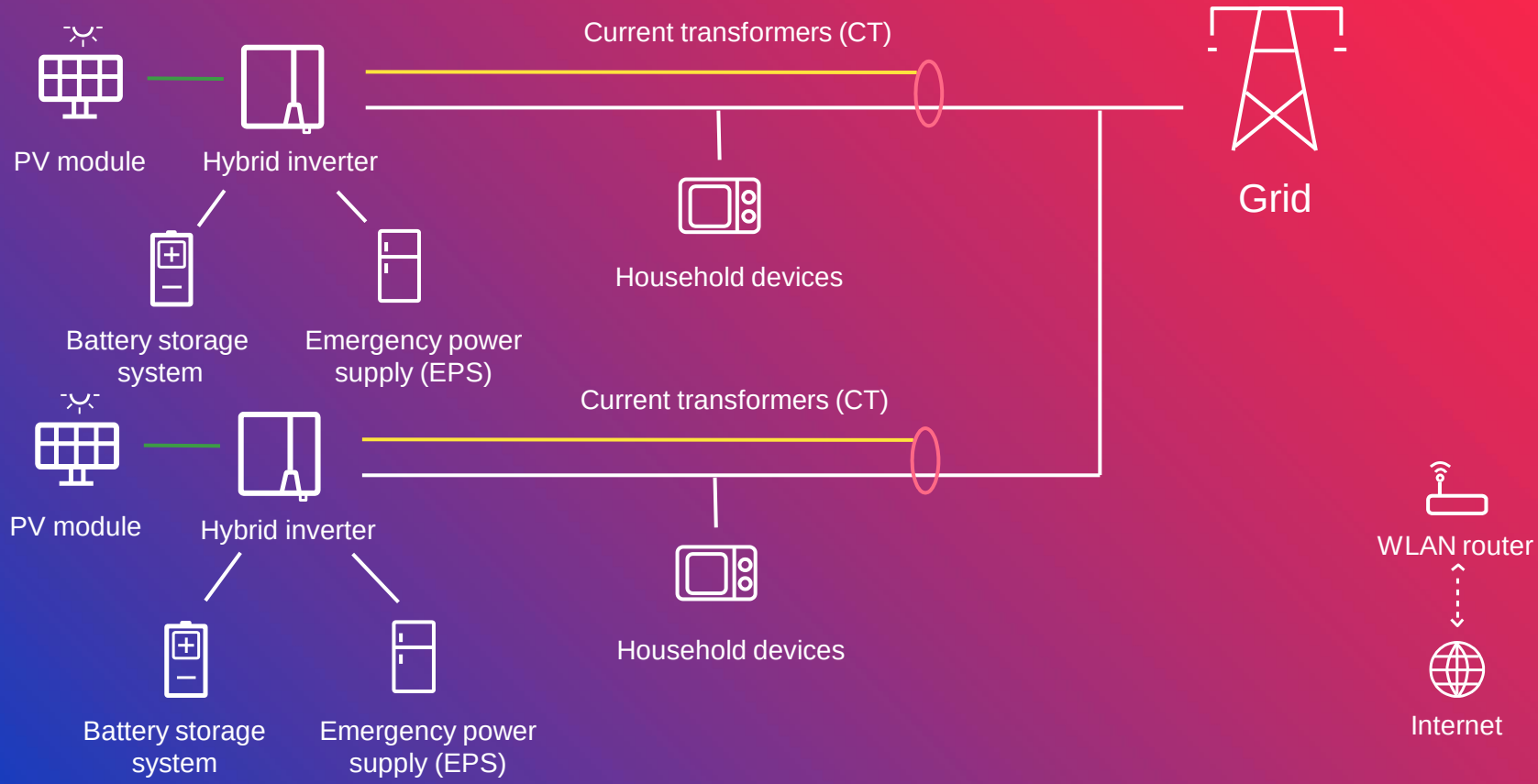
EPS outputs


PV Module
Hybrid inverter
Grid
Household devices
Battery storage system
Emergency power supply (EPS)
Backup 1
Fully operational battery range
Emergency power supply (EPS)
Backup 2
Operates from 50-100% battery
WLAN router
Internet

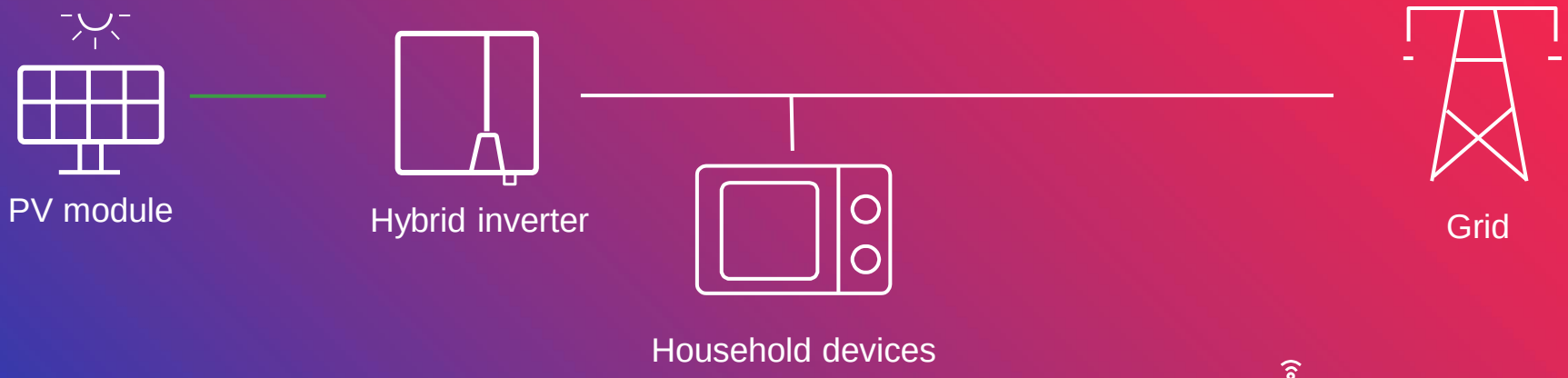
The building



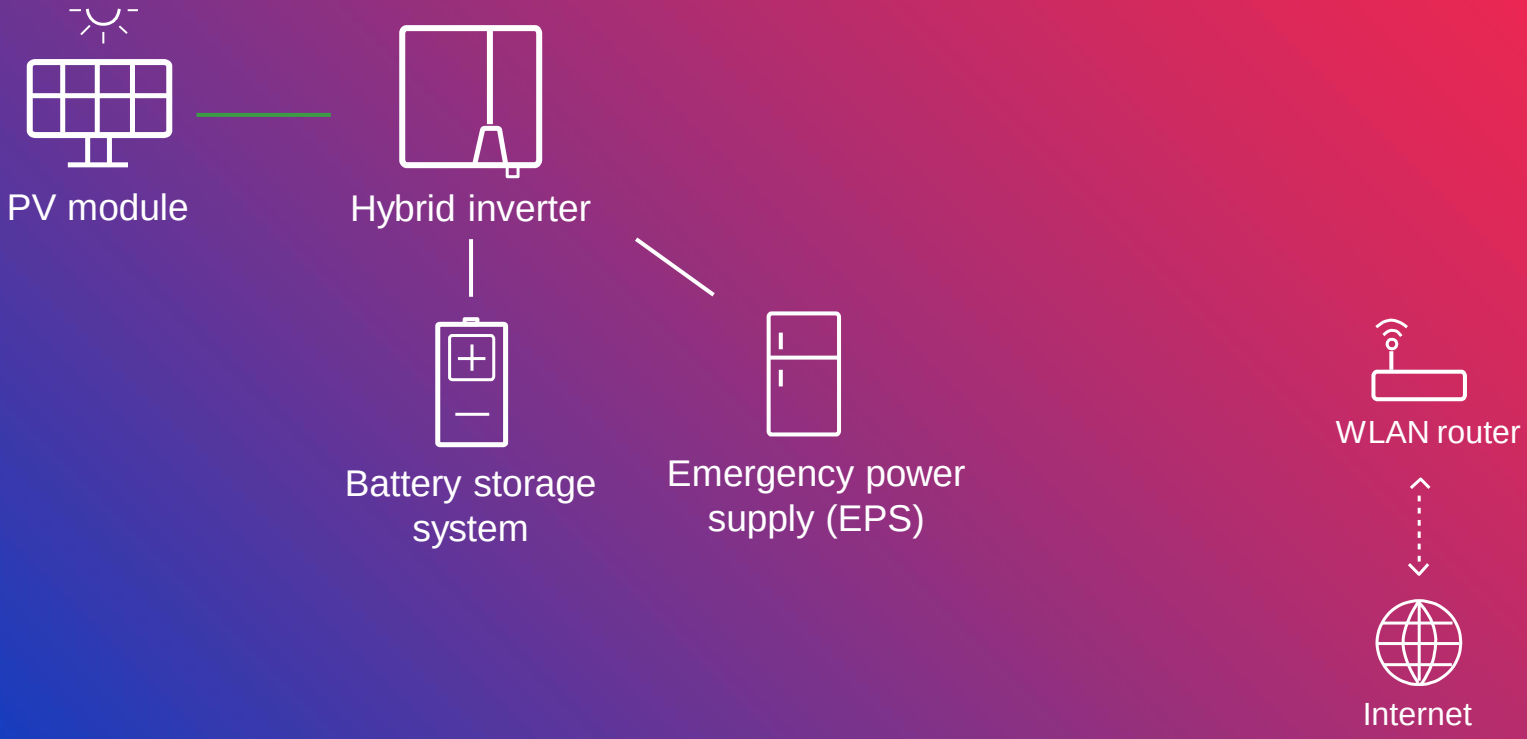
The building



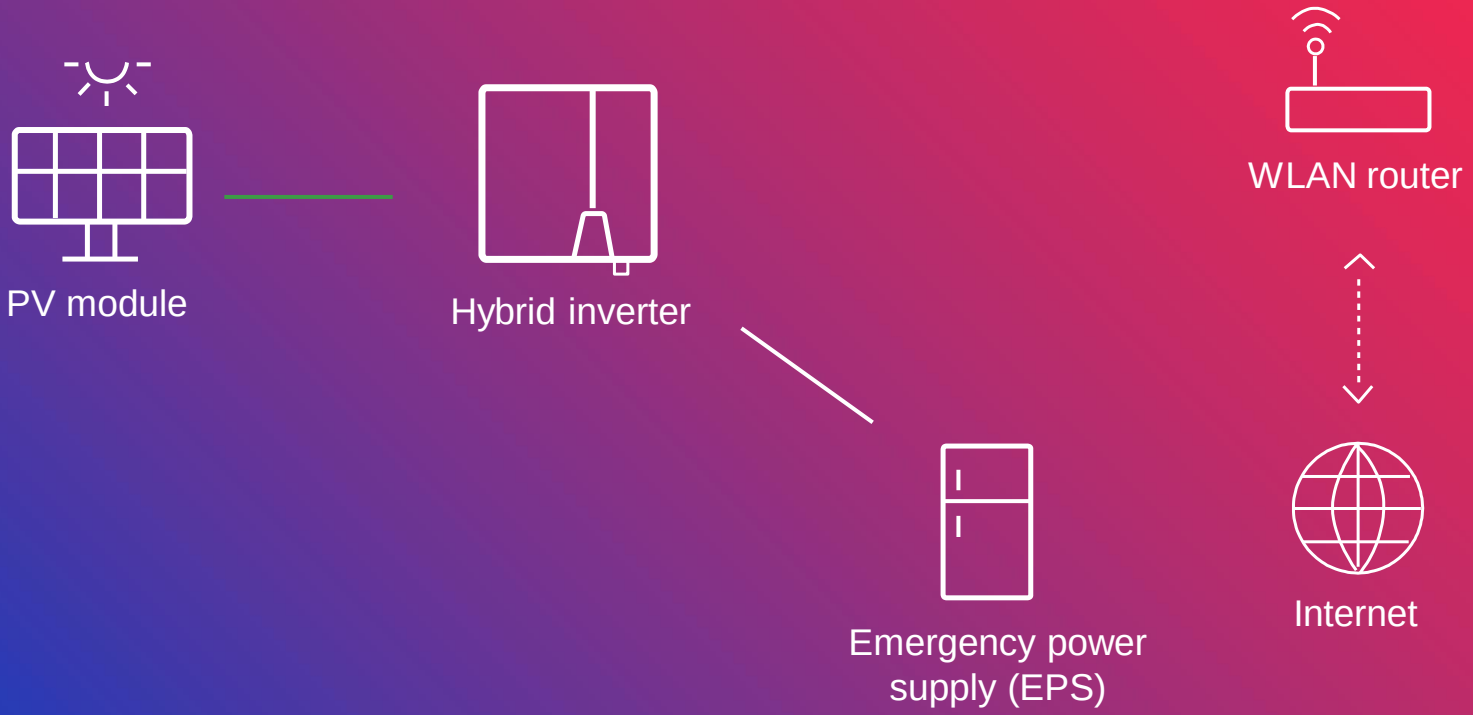
Operation in on-grid mode without energy bank



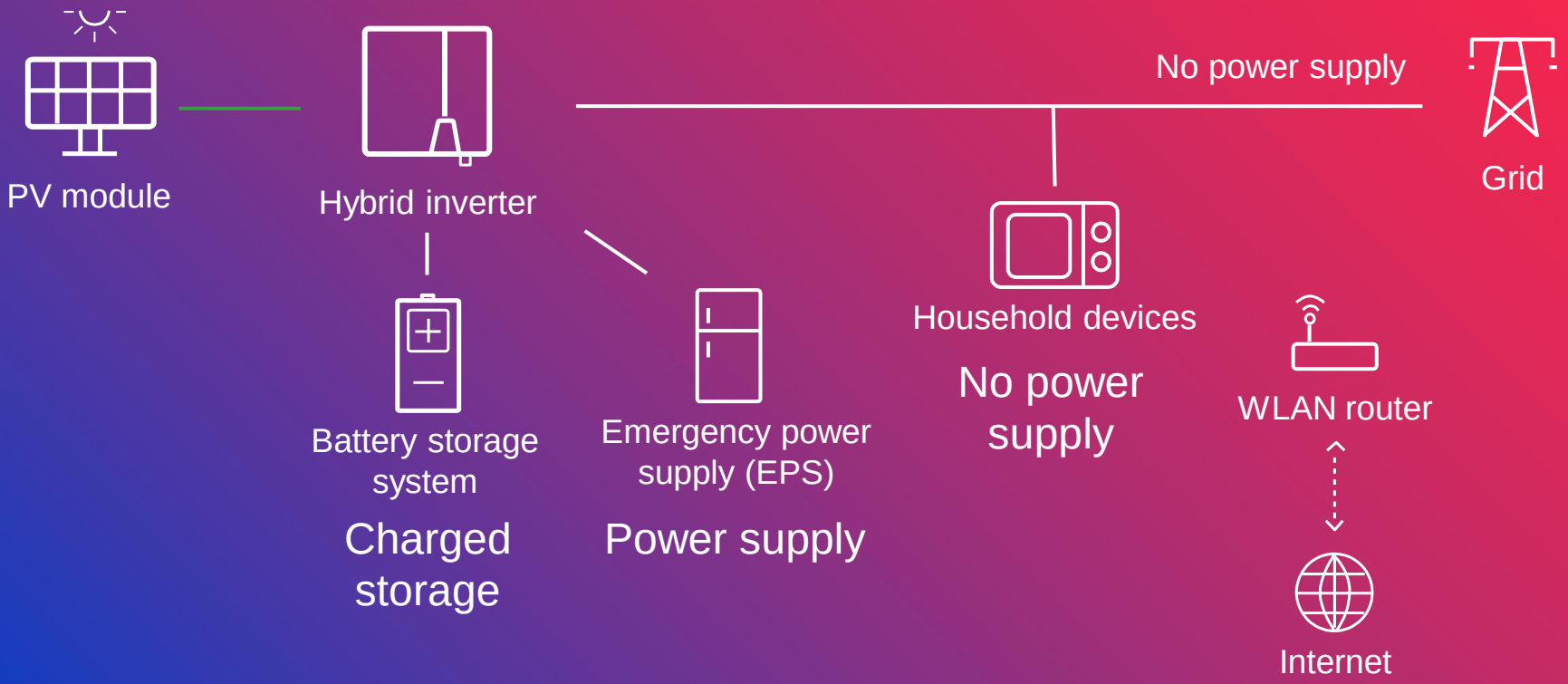
Operation in off-grid mode



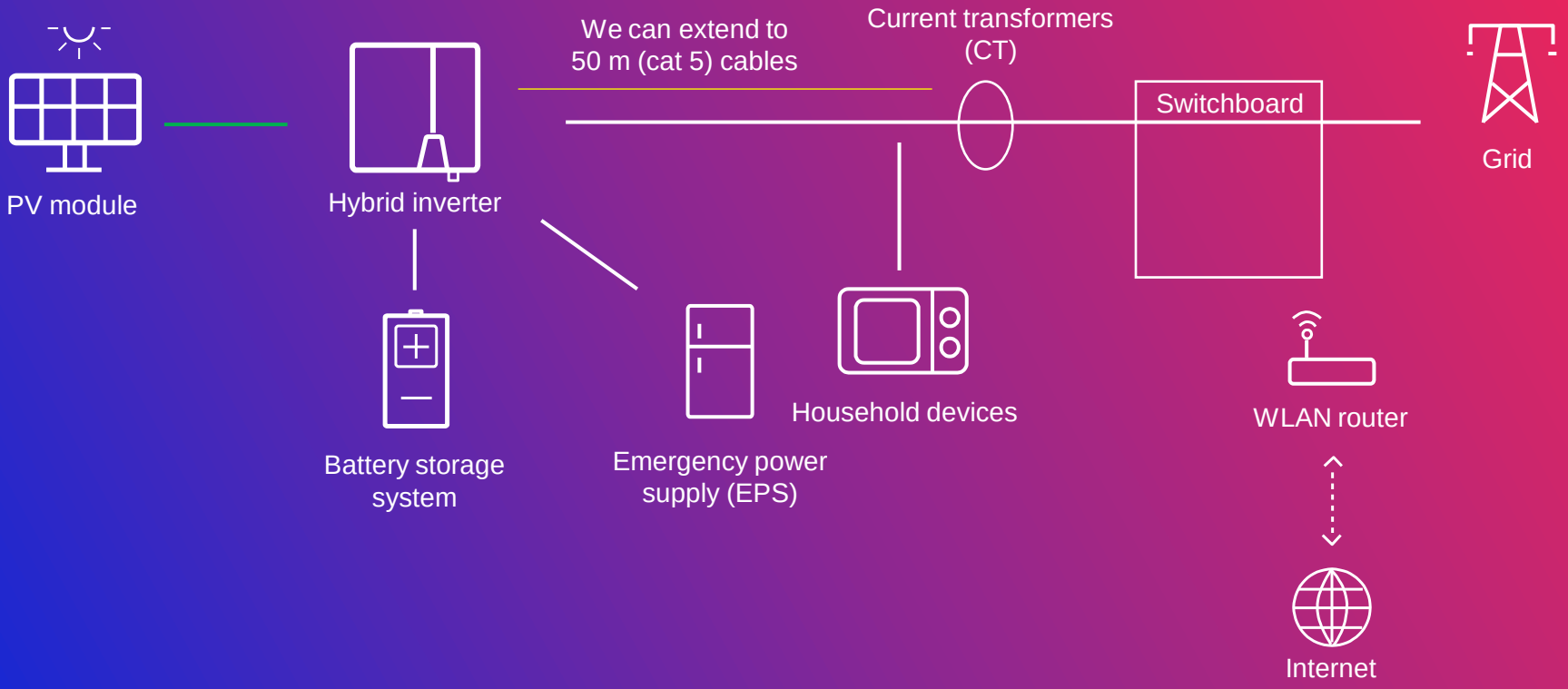
Operation in off-grid mode without energy bank - impossible



In case of power failure



The building



Frequently asked questions:

- FM update

  Currently, we do it remotely, but it is absorbing,
  so we provide the latest update files for local update
  (via laptop and phone).
  In the case of a hybrid inverter, the WiFi stick is updated by
  phone and the inverter is updated by a laptop.

Frequently asked questions:

- Is it necessary to connect CTs (current transformers)?

Yes, it is necessary, because we will see incorrect data in the App.

Frequently asked questions:

- 1 meter of cable for current transformers is not enough.

  Yes, it was enough, so now we can extend it to 50 meters with a cables cat 5.

Frequently asked questions:

- Can the inverter work without battery?

  Yes, as you saw above, the inverter can work without battery.

Frequently asked questions:

- Can the inverter work without the grid?

  Yes, yes inverter can works without grid but it have to have battery and PV.

Frequently asked questions:

- Is the EPS output three-phase?

  Yes, but you can also connect one or two phases if needed.

Frequently asked questions:

- What is the power of the EPS output?

  Power outputs of EPS is the same as power inverter.

Frequently asked questions:

- What happens when the grid voltage is too high?

In this case, on-grid inverter will not work and wait for the correct voltages.
Hybrid inverter will work but without grid (off-grid).

Example:
If the 10-minute average exceeds 253 V or the voltage will be increase above 264 V at moment, the inverter will stop working with the grid. This means that the devices connected to the EPS outputs will be supply with the PV and battery but not with the grid. Thanks to this, the inverter will protect the devices at the EPS outputs against dangerously high voltage and will continue to work on PV and battery.

The most common mistakes made by installers:

- Wrong direction of phase rotation- inverter does not interact with the grid
- Wrong order of current transformers (colours) - wrong data in the application
- No current transformers connected - wrong data in the application
- Whole-house connection to EPS – easy to overload

What to have in mind:

- Connect the current transformers correctly before commissioning
- Do not disconnect the current transformers during operation
- Check the direction of rotation of the phases
- Update FW of the inverter and WiFi module

What do you gain by choosing Solplanet hybrids:

- 2 backup outputs (EPS) including one with saving mode
- Three-phase backup (EPS) outputs

  (but also only one or two phases can be connected)
- No need for additional and costly components such as an ATS

  (stand-by system)
- No need for additional two-way smart meters

  (current transformers included)
- Can operate without batteries

  (as a standard inverter with the possibility of expansion)

4. Working modes

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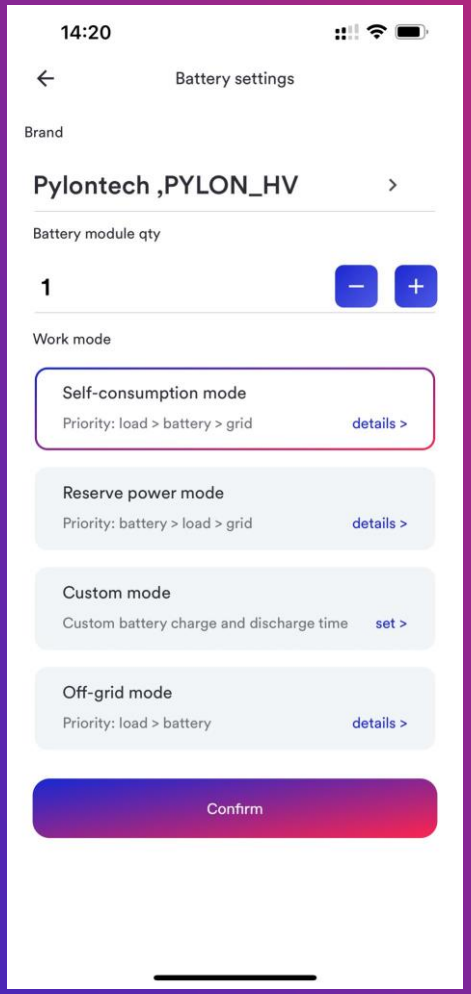
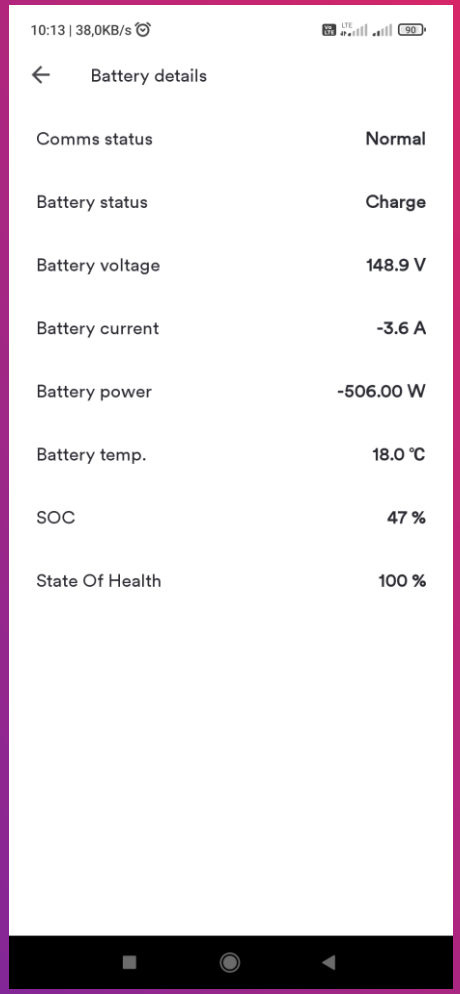
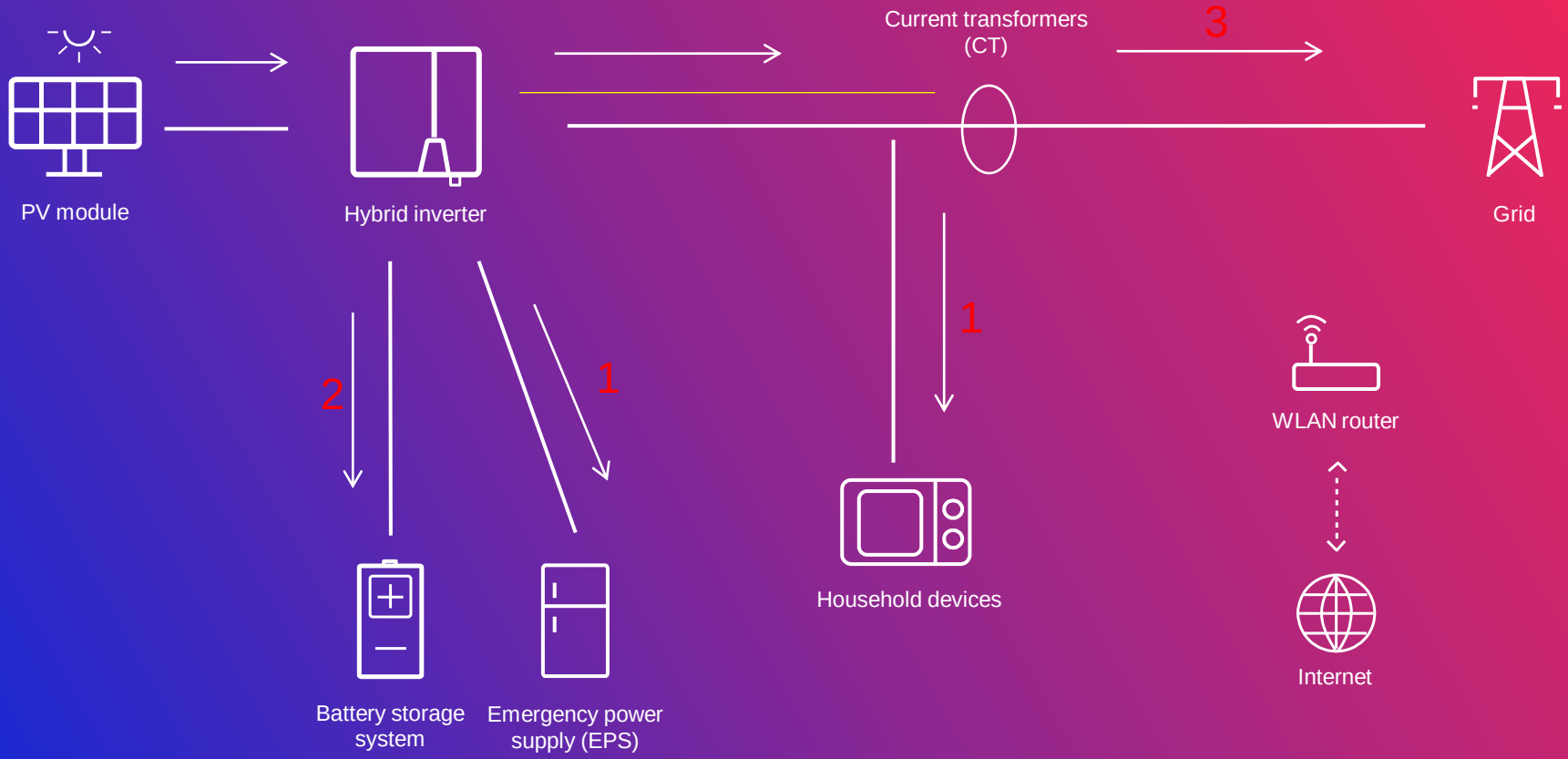

14:20
Battery settings
Brand
Pylontech ,PYLON_HV
Battery module qty
1
Work mode
Self-consumption mode
Priority: load > battery > grid
details >
Reserve power mode
Priority: battery > load > grid
details >
Custom mode
Custom battery charge and discharge time
set >
Off-grid mode
Priority: load > battery
details >
Confirm

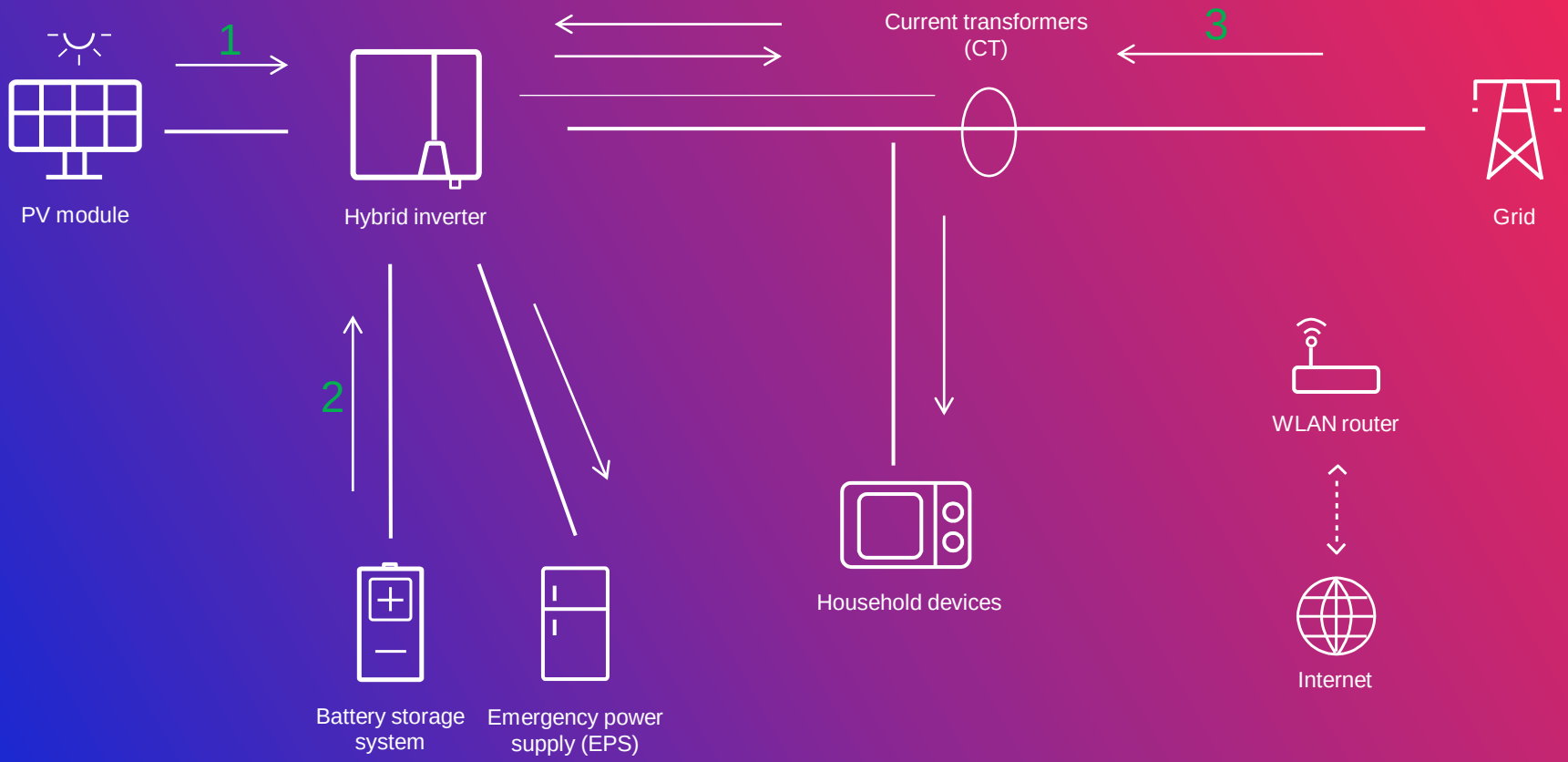

10:13 | 38,0KB/s
Battery details
Comms status
Normal
Battery status
Charge
Battery voltage
148.9 V
Battery current
-3.6 A
Battery power
-506.00 W
Battery temp.
18.0 ℃
SOC
47 %
State Of Health
100 %

Self-consumption mode

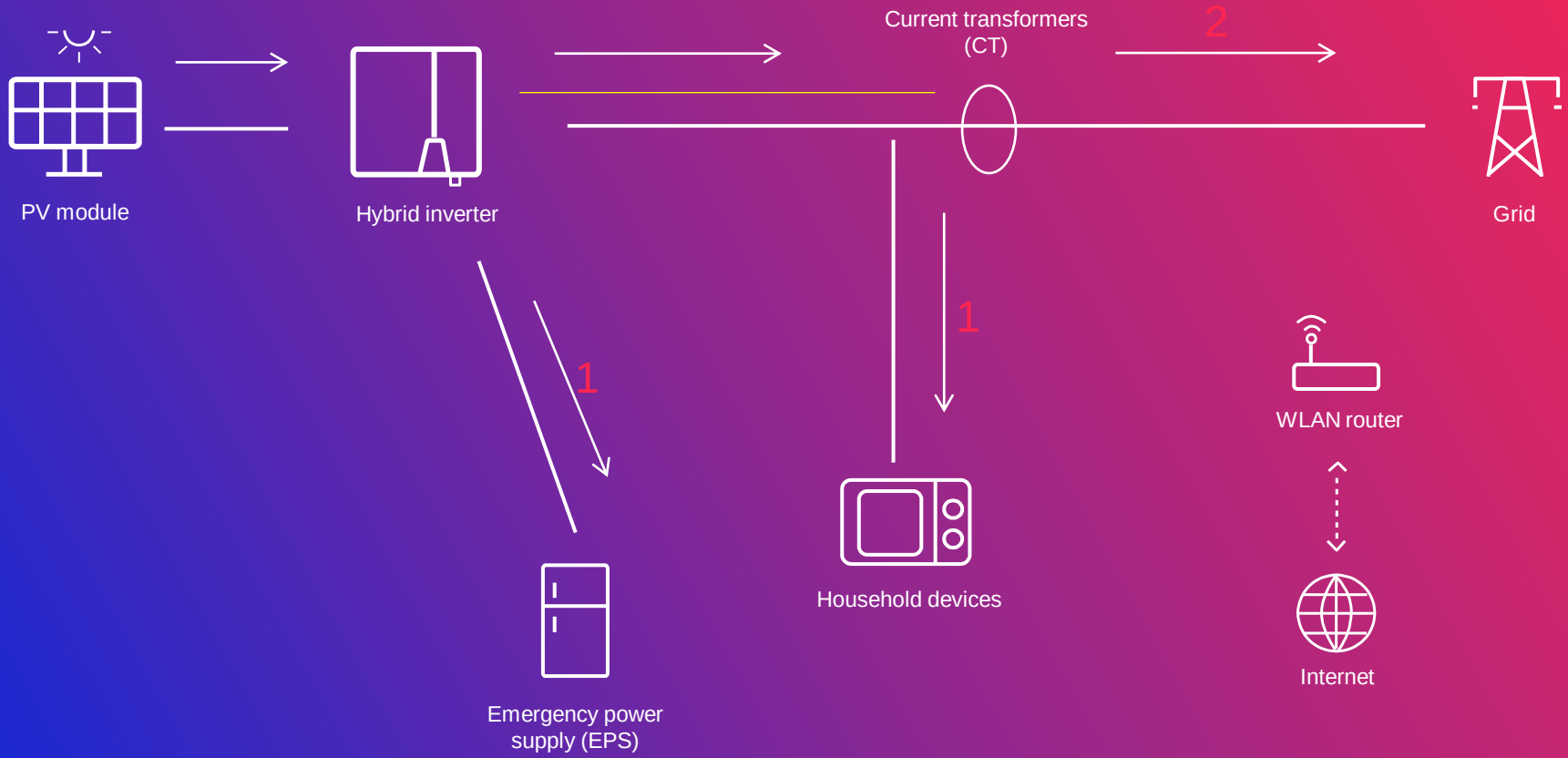
When PV, Grid, Battery is available



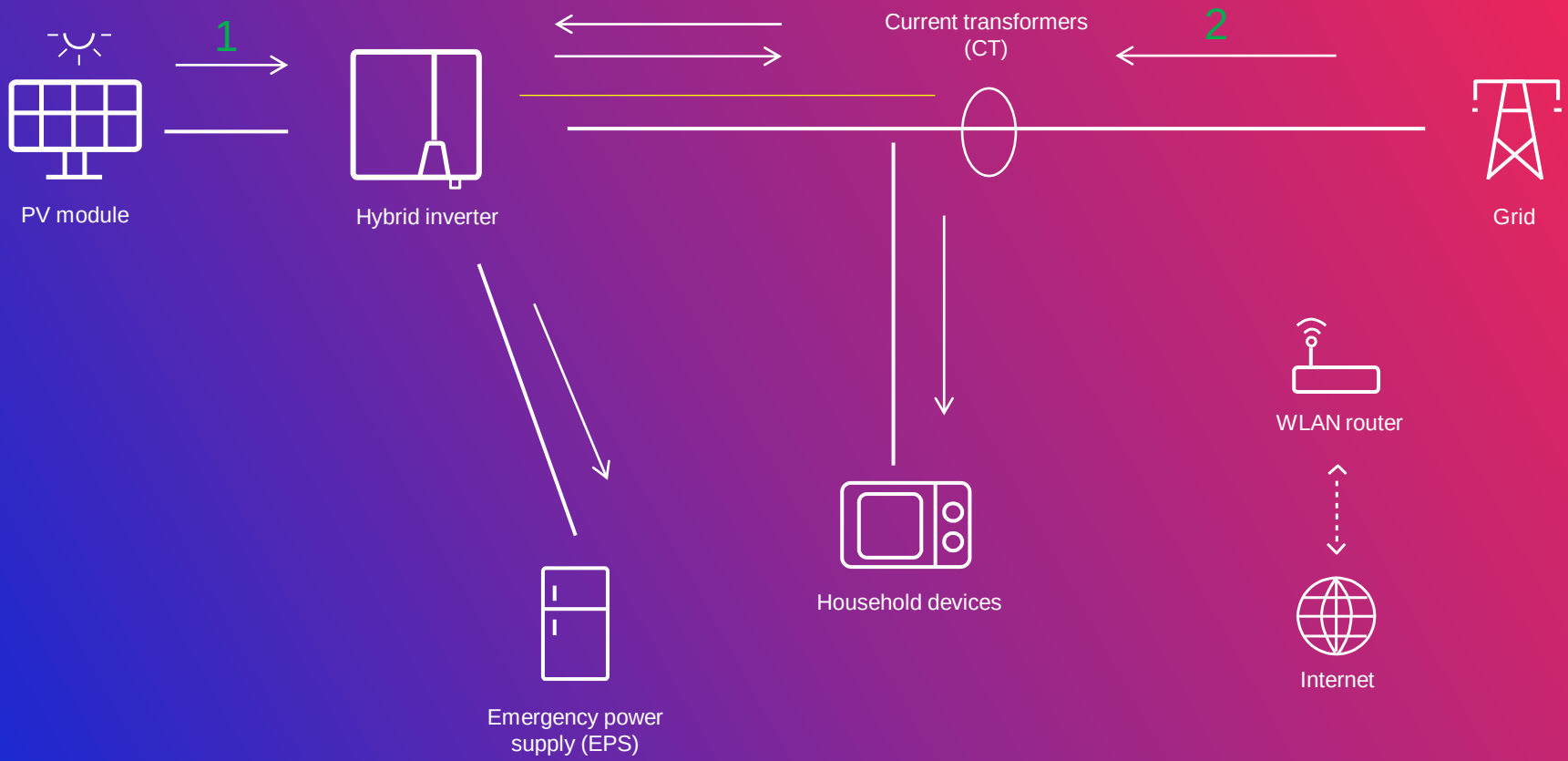
When PV, Grid, Battery is available



When PV, Grid is available (without battery)

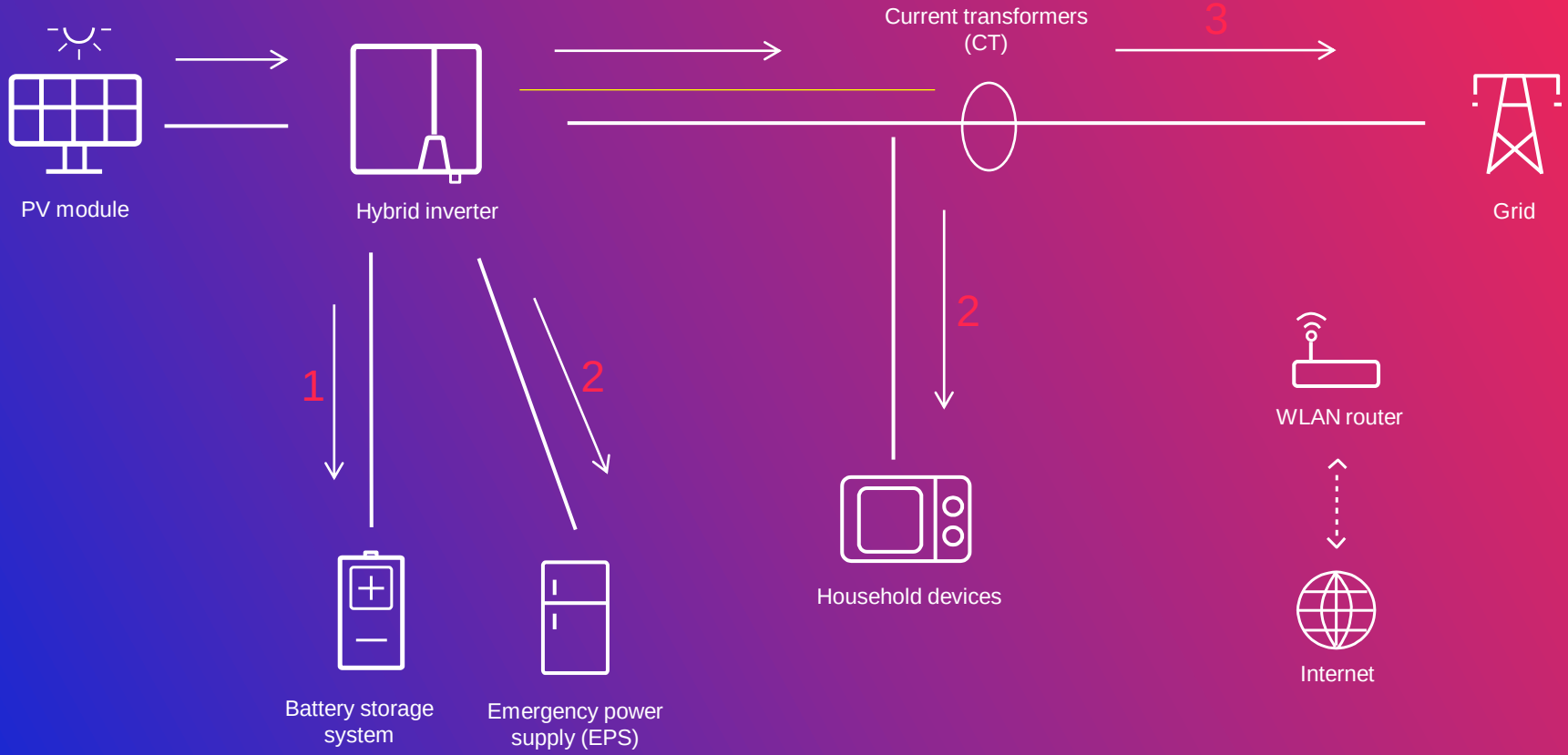


When PV, Grid is available (without battery)

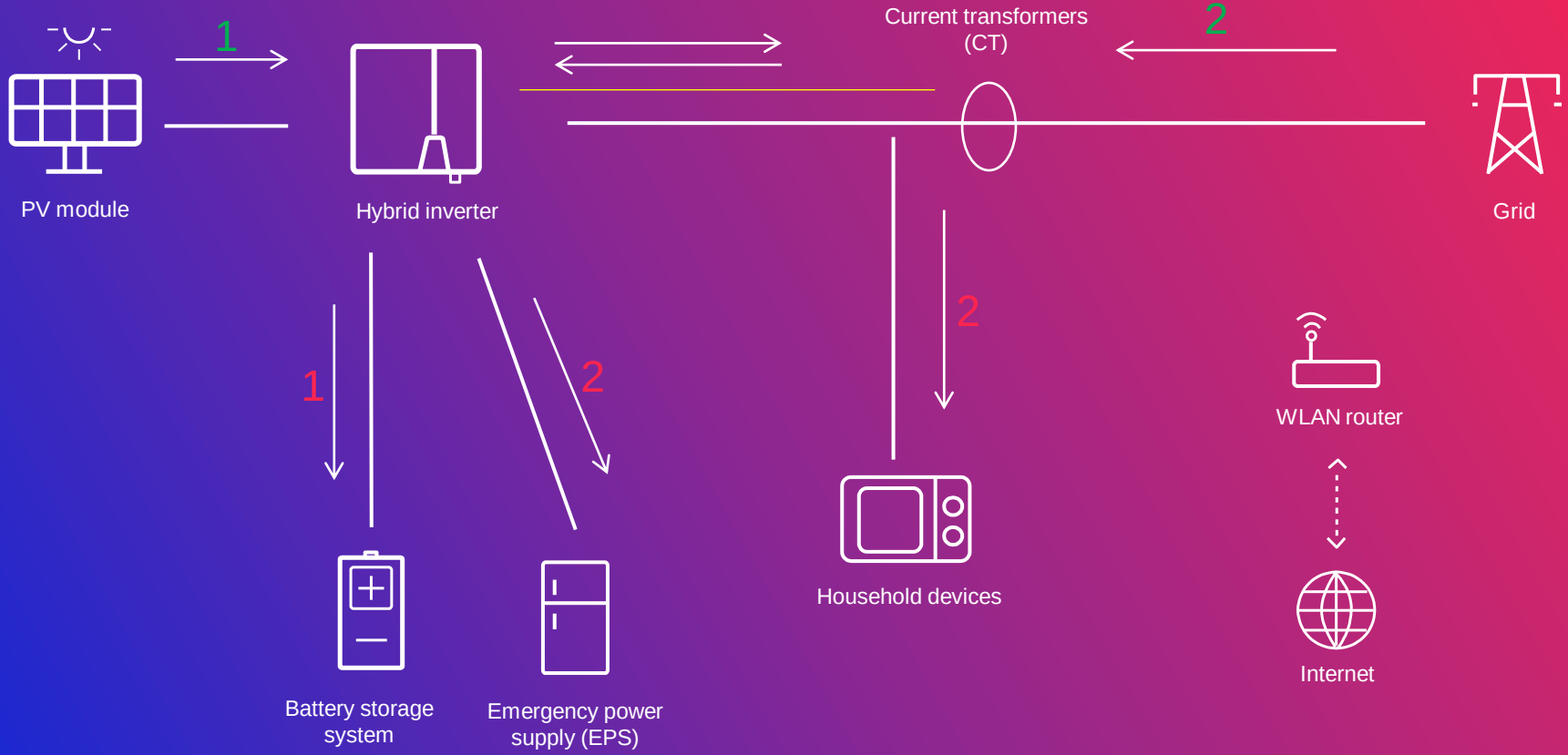


Customised mode

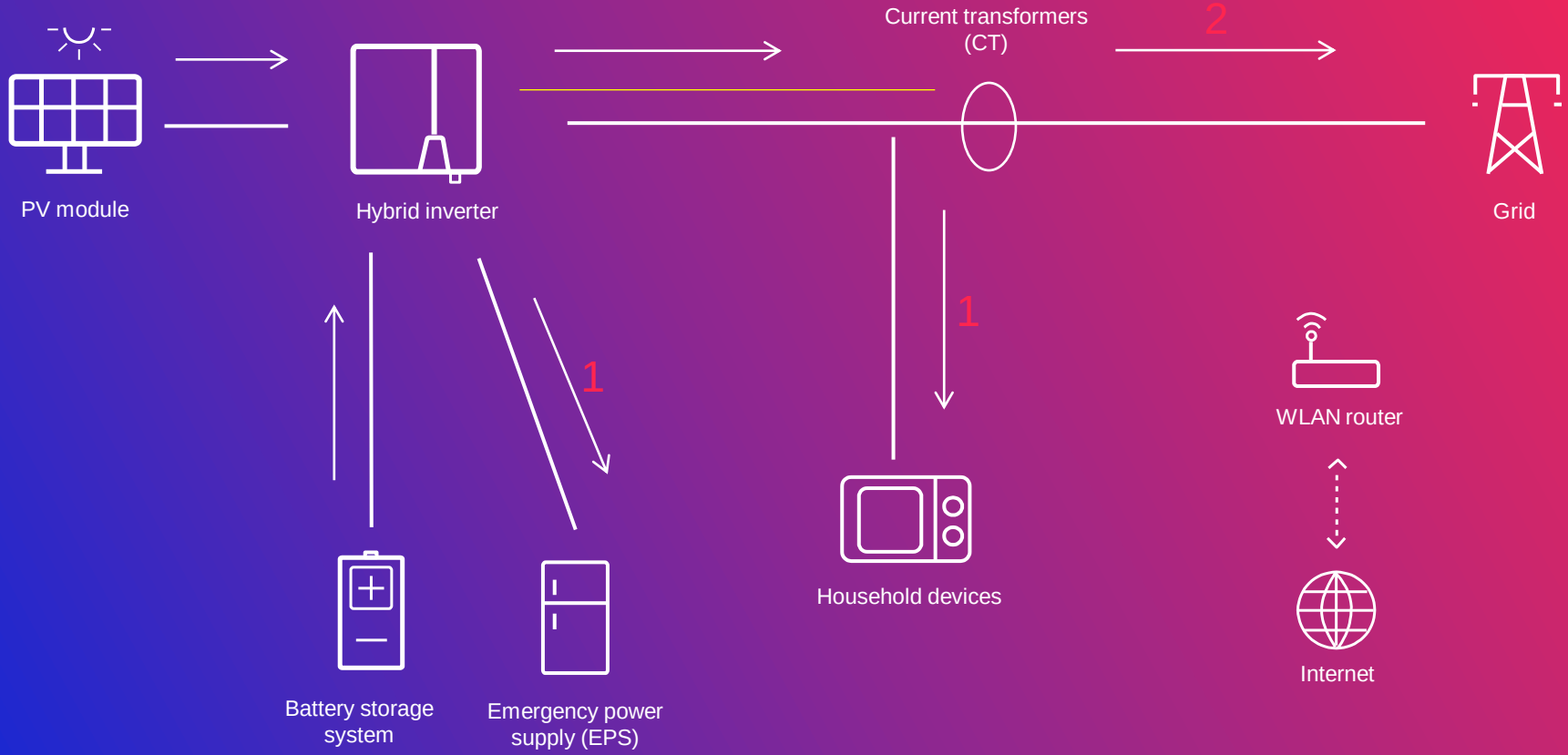
When PV, Grid, Battery is available - on charge time



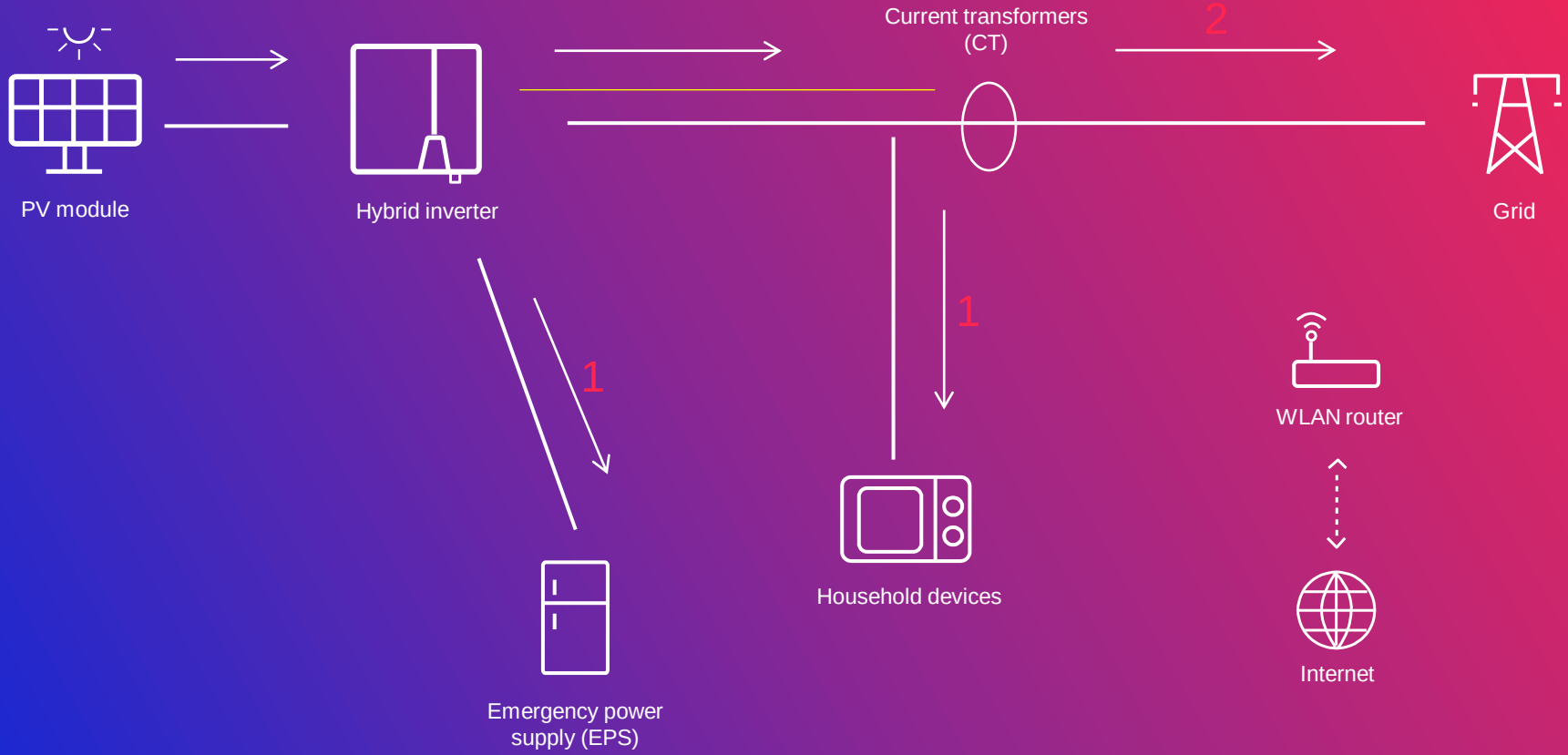
When PV, Grid, Battery is available - on charge time



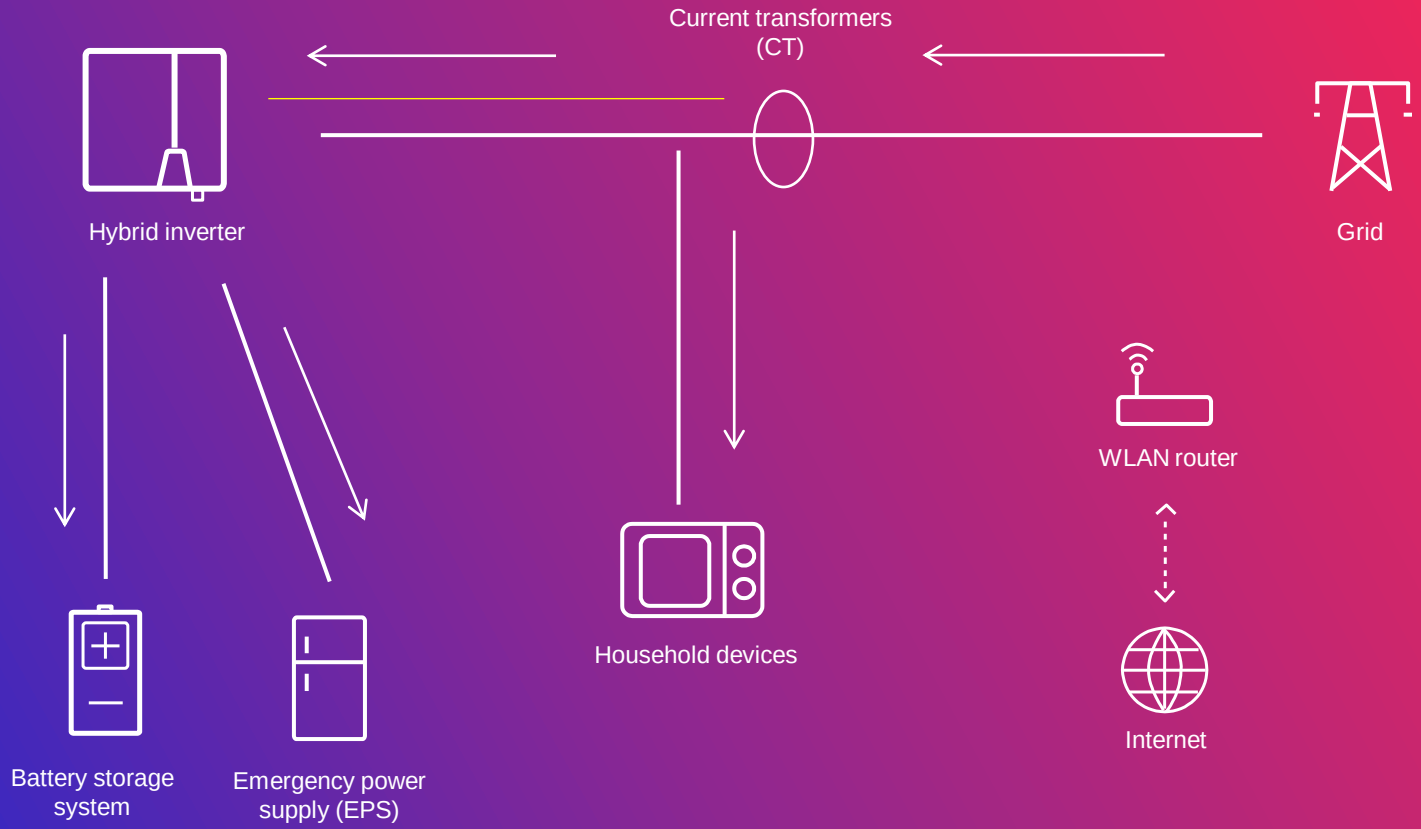
When PV, Grid, Battery is available - on discharge time



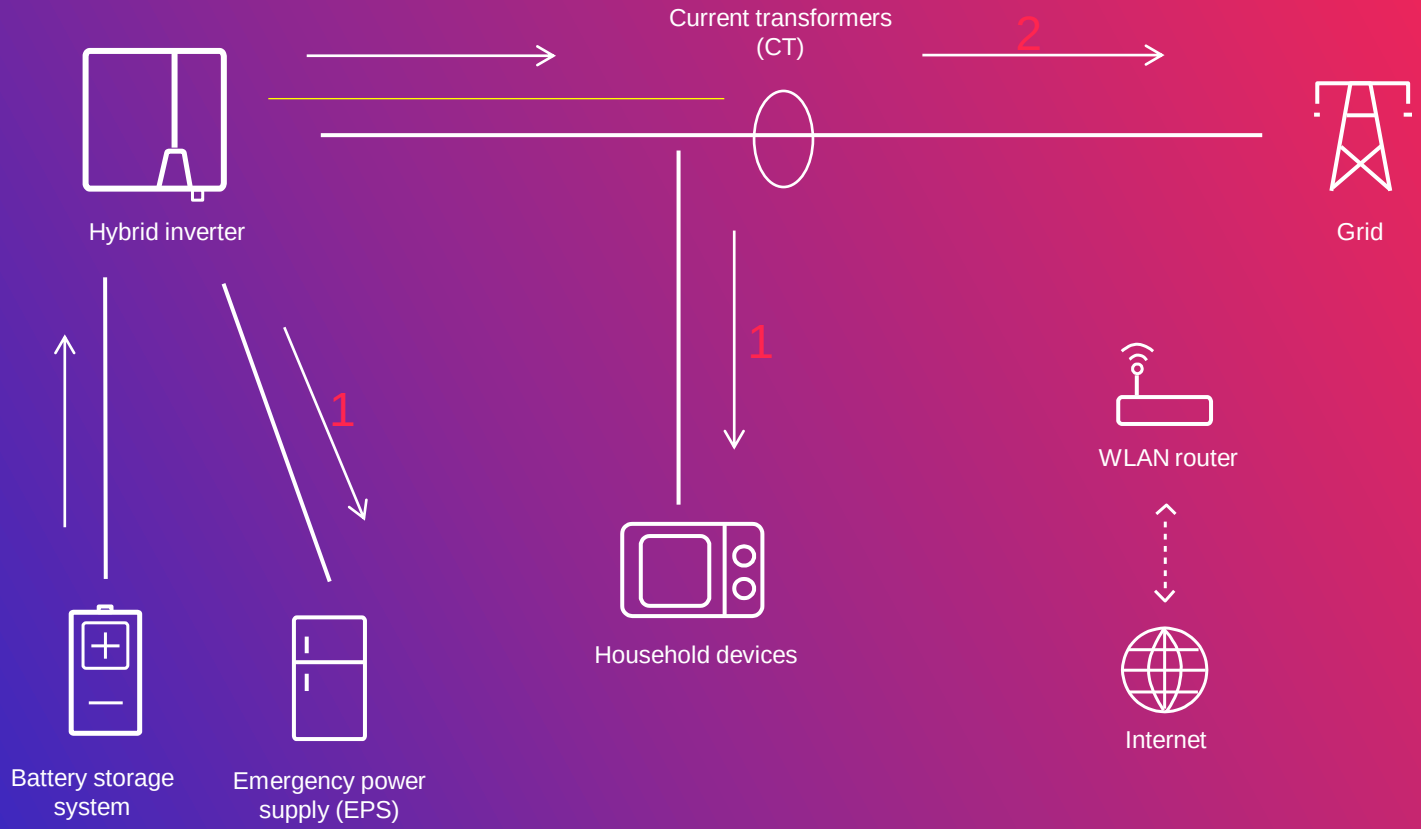
When PV, Grid, Battery is available - no charge or discharge



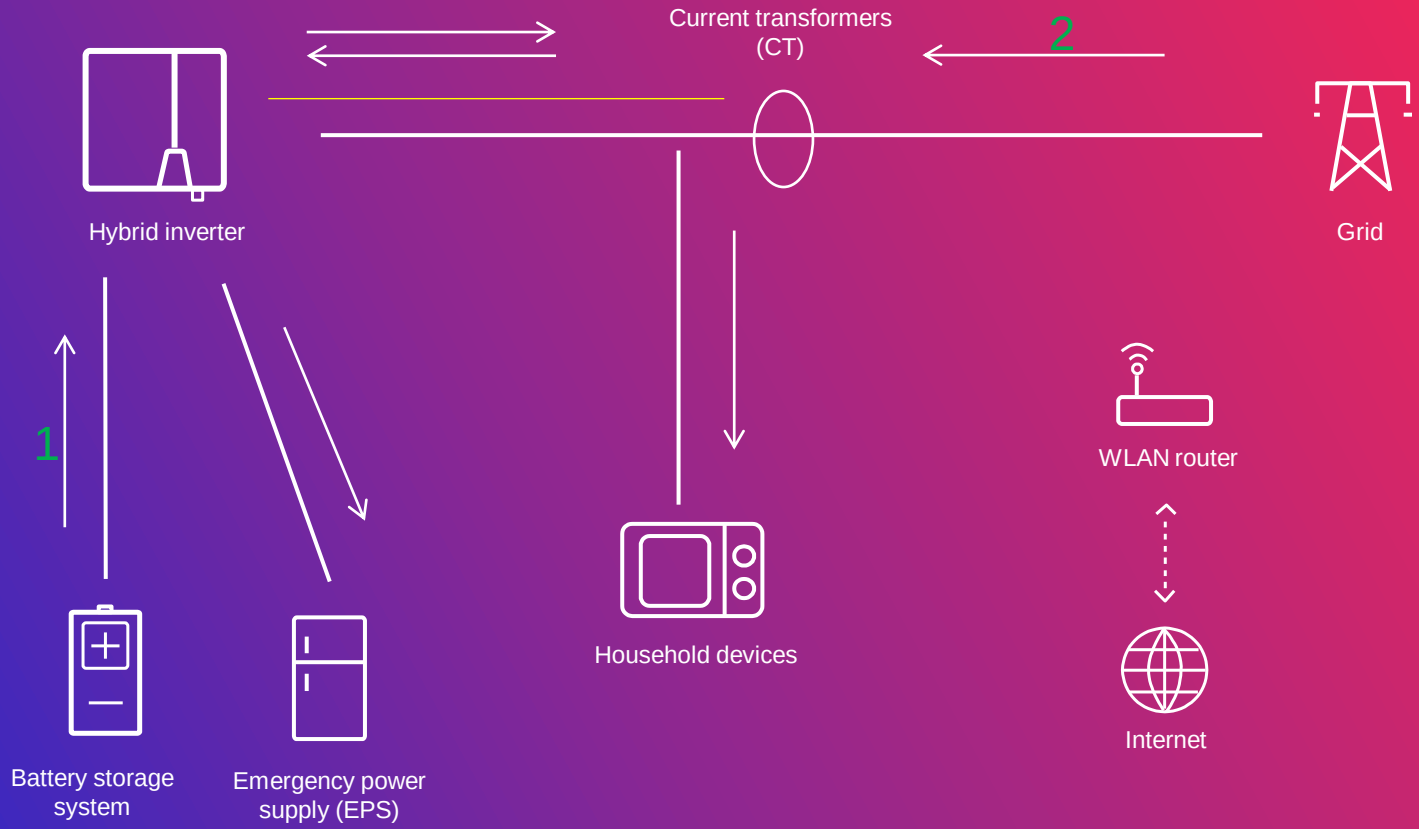
When Grid, Battery is available (PV is disconnected) – on charge time



When Grid, Battery is available (PV is disconnected) – on discharge time

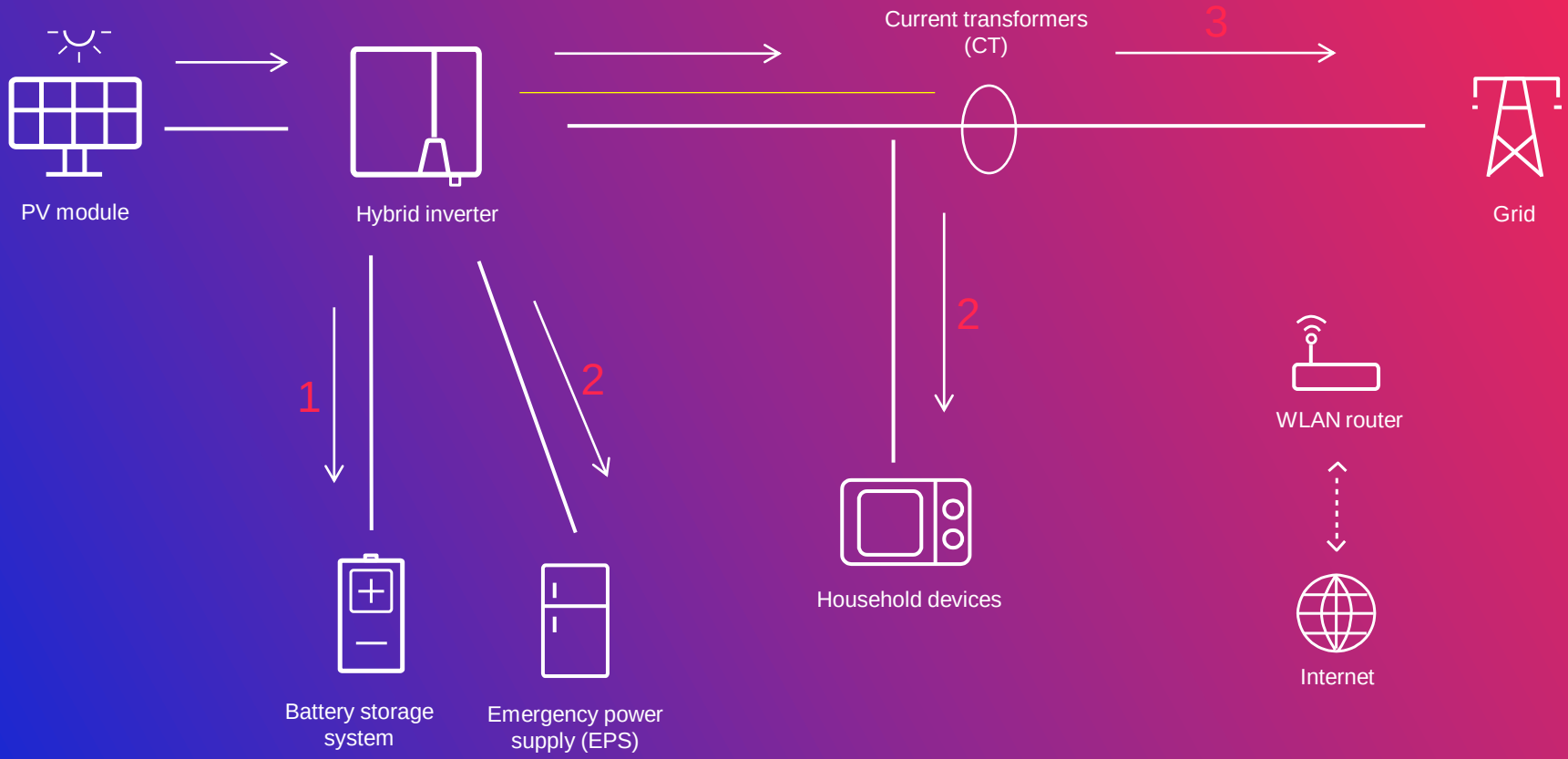


When Grid, Battery is available (PV is disconnected) – on discharge time

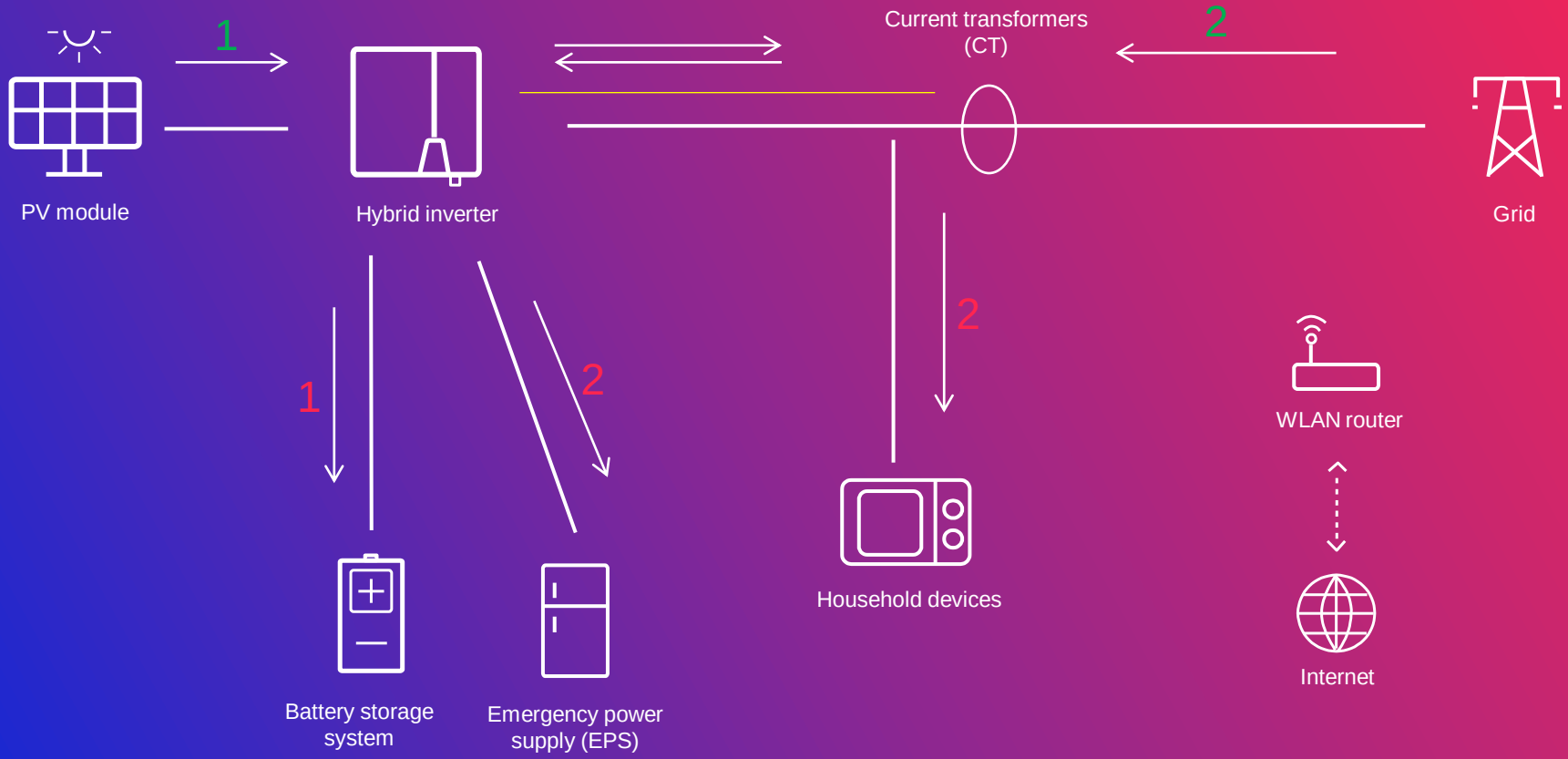


Reserve power mode

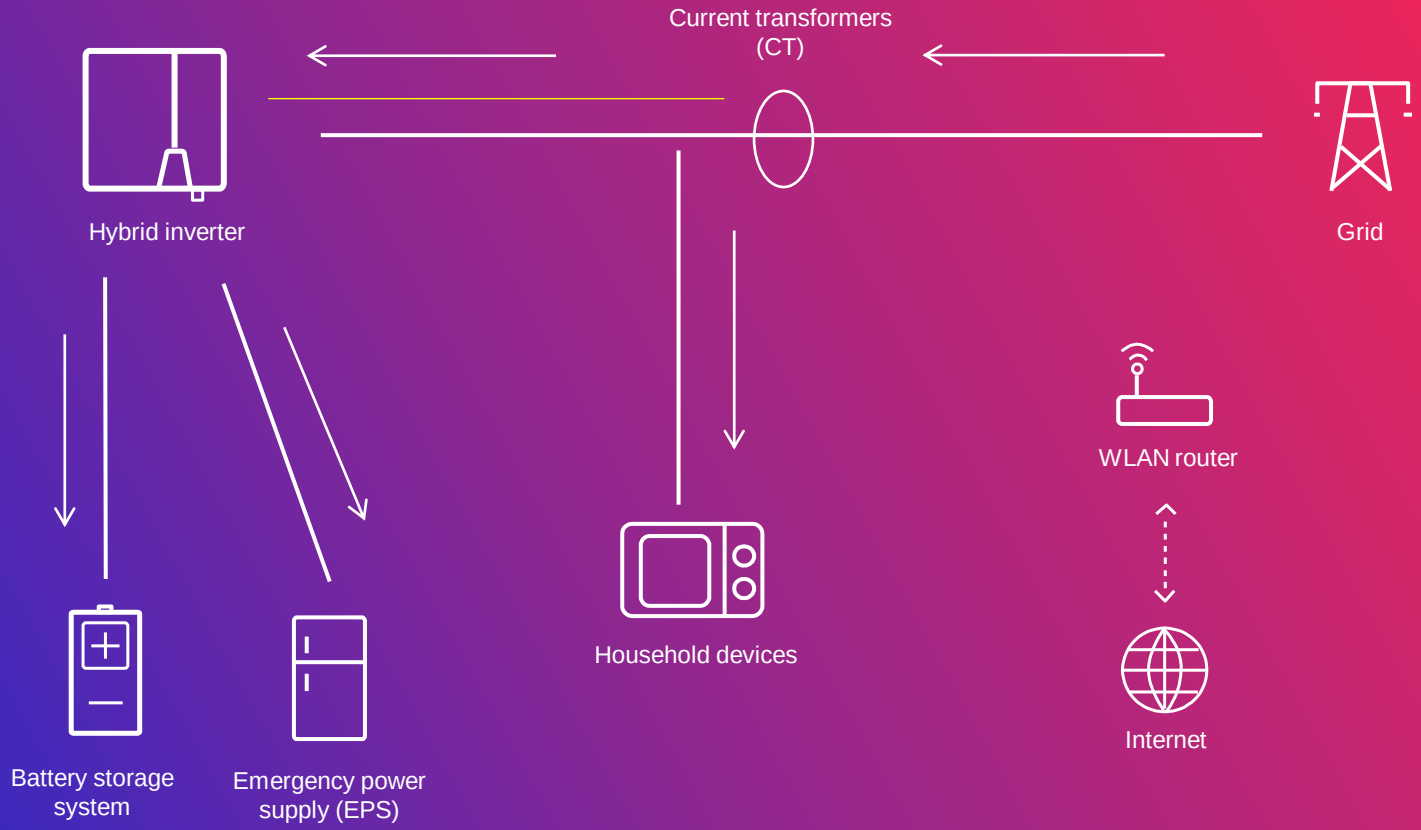
When PV, Grid, Battery is available



When PV, Grid, Battery is available

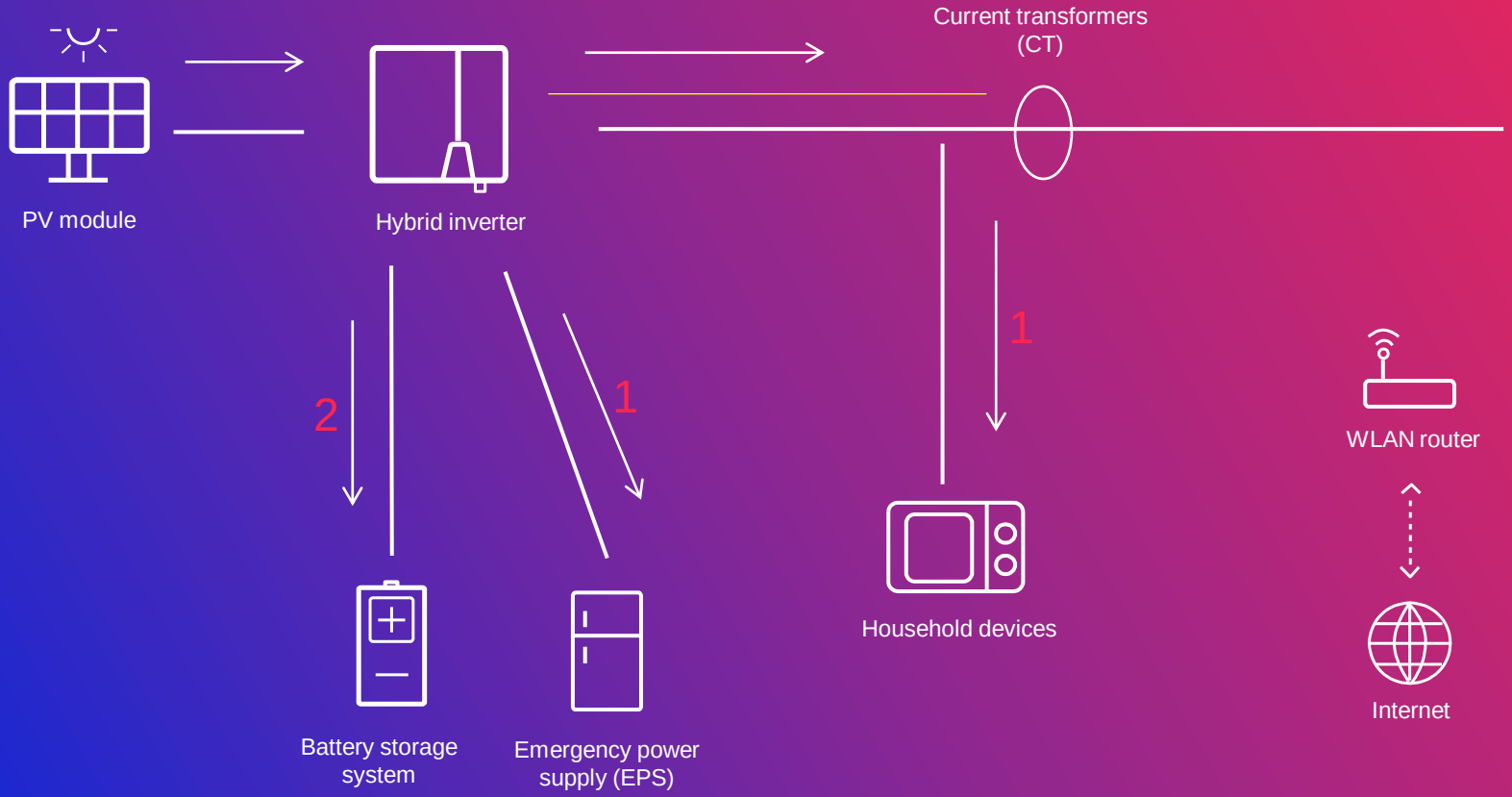


When Grid, Battery is available (PV is disconnected)

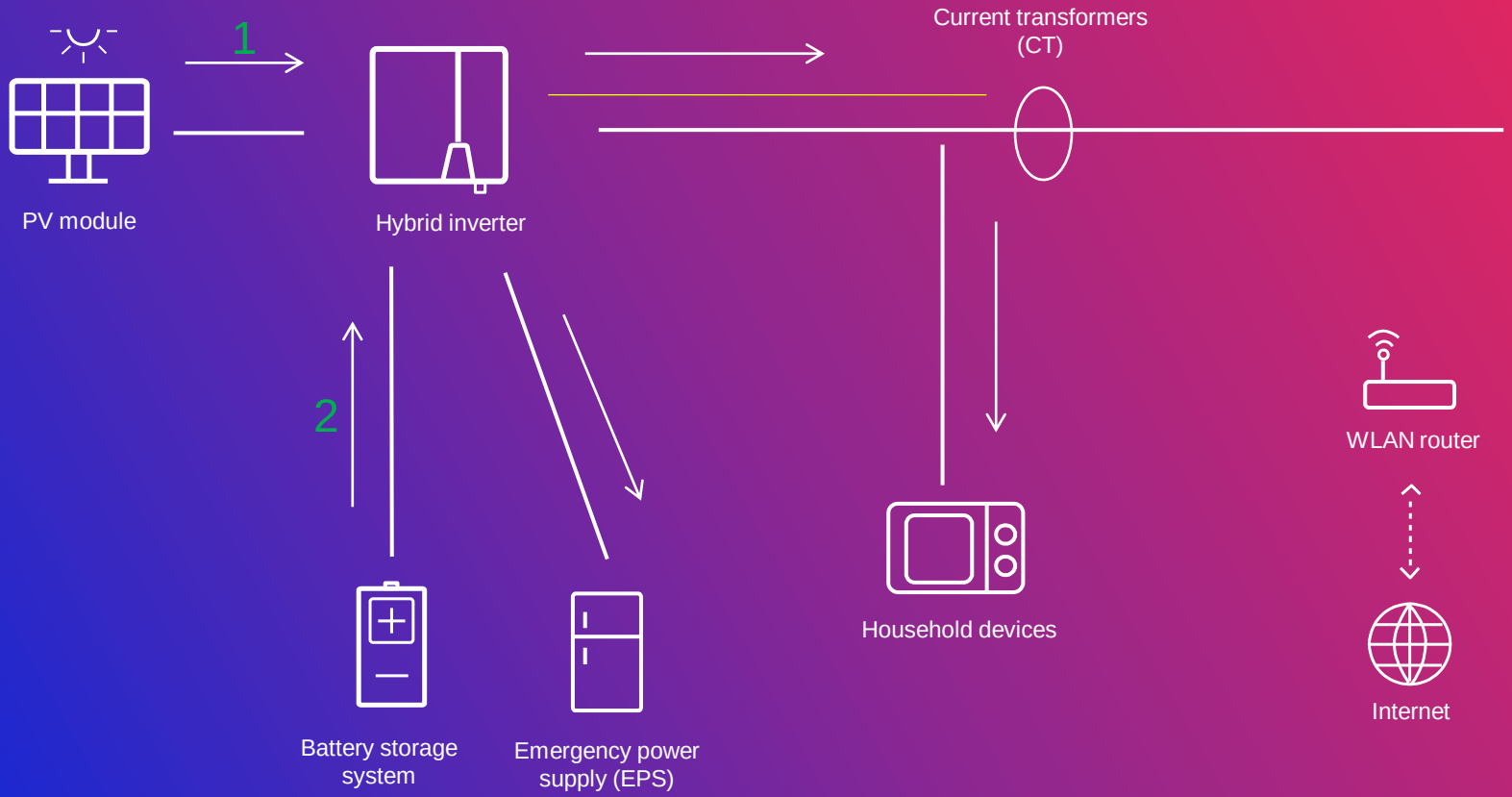


Off grid mode

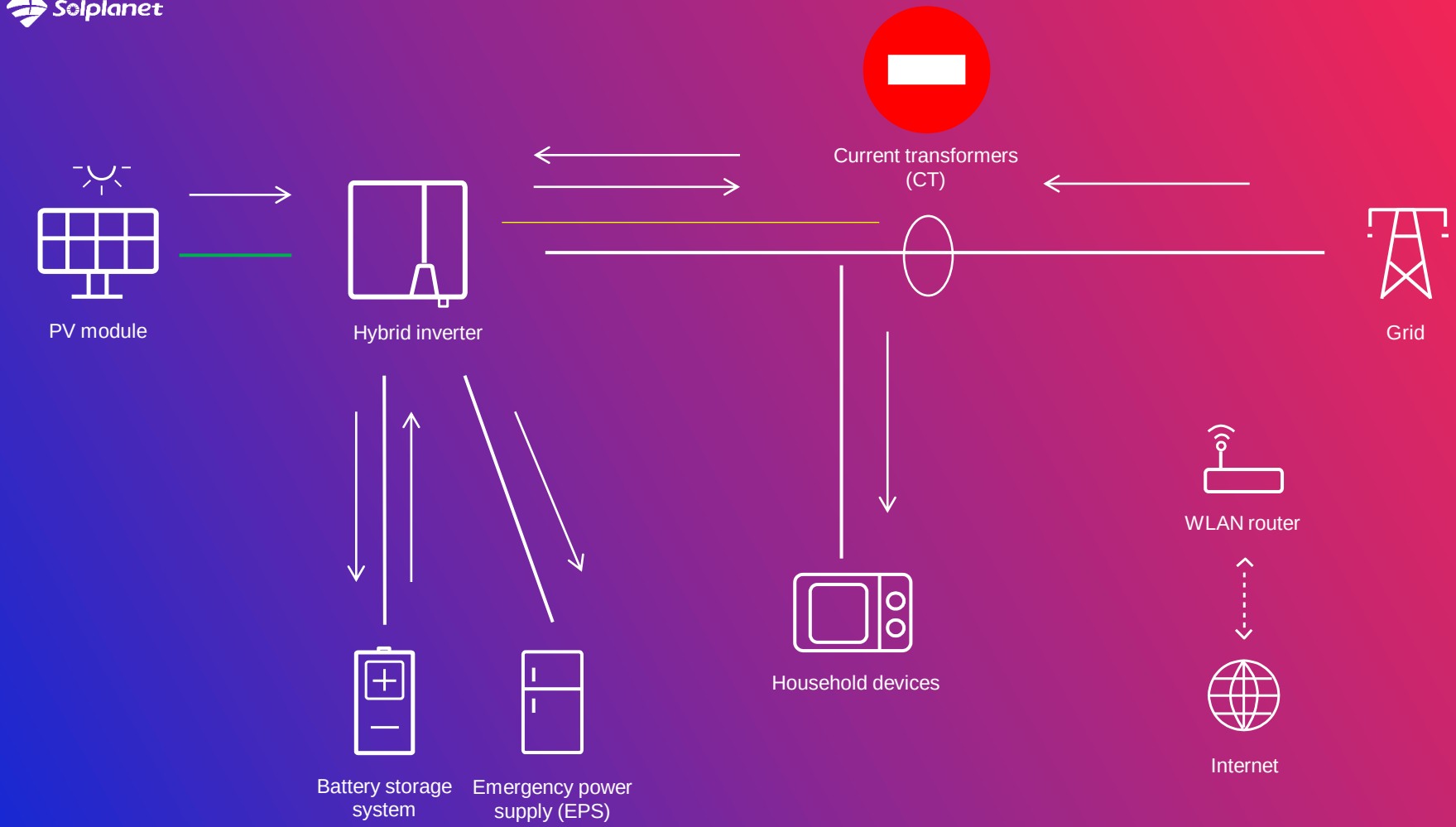
When PV, Battery is available (Grid is disconnected)



When PV, Battery is available (Grid is disconnected)



Zero export function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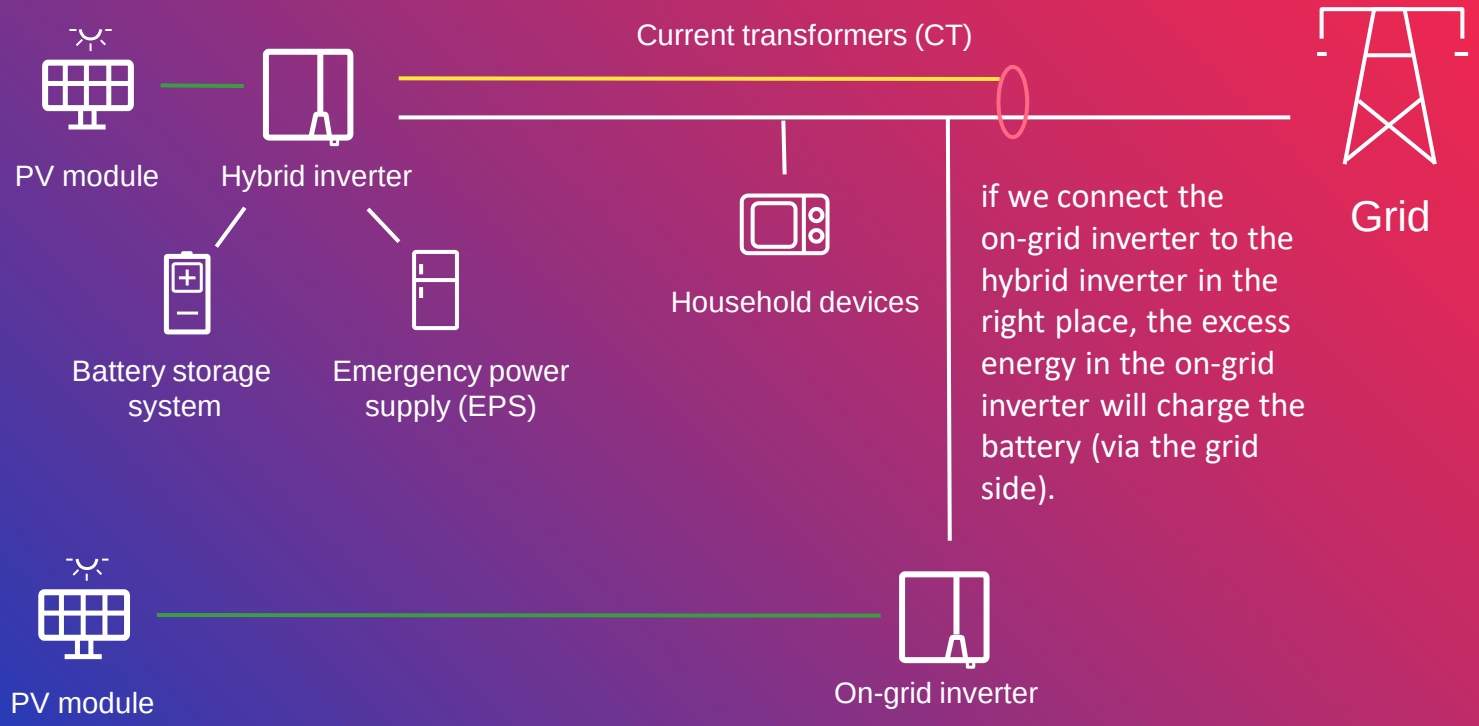
Current transformers (CT)
PV module
Hybrid inverter
Grid
WLAN router
Household devices
Internet
Battery storage system
Emergency power supply (EPS)

At the end

Positive fact



5. Success case

Solplanet

Solplanet

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Solar for everybody

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