

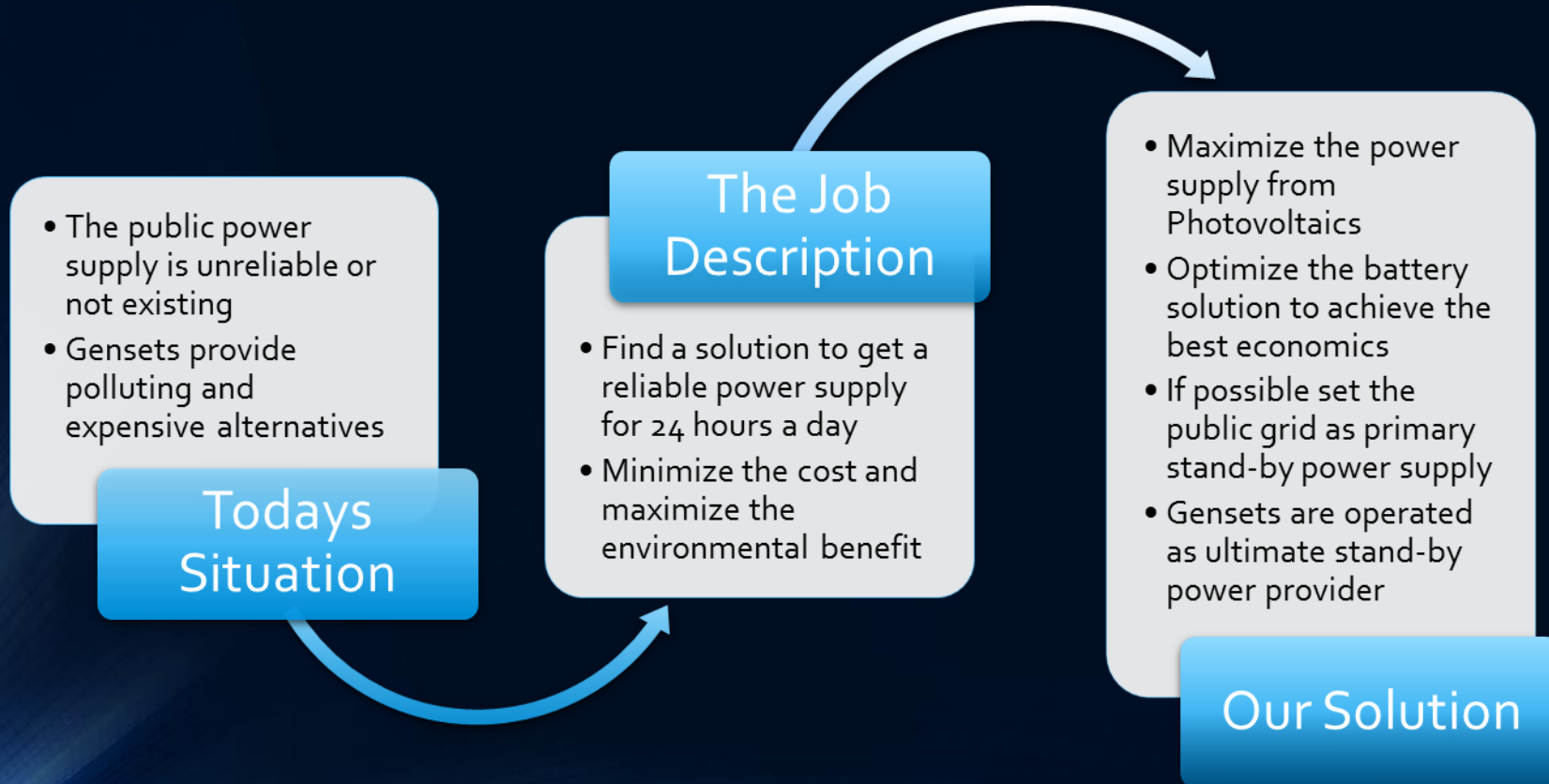
NP smart base 60k

LET US MANAGE YOUR SELF-CONTAINED POWER SUPPLY

Who we are NP Energy AG + E-Projekt d.o.o.

- We are two companies cooperating since several years
- We have 35 years experience in all matters of electricity generation from design till installation
- We formed SOLHYS to break new ground for the decentralised power generation
- We are free to take the best components for our solutions
- We designed our NP smart base product series to cope with any challenge of photovoltaic power supply combined with individual load characteristics

The way to the NP smart base



The NP smart base 60k components

Top Quality PV-modules including patented foldable rack
90 kW-p (323 units – installation area 900 m²)



Strong OPzV-Battery Pack
120.000 Ah (2V)



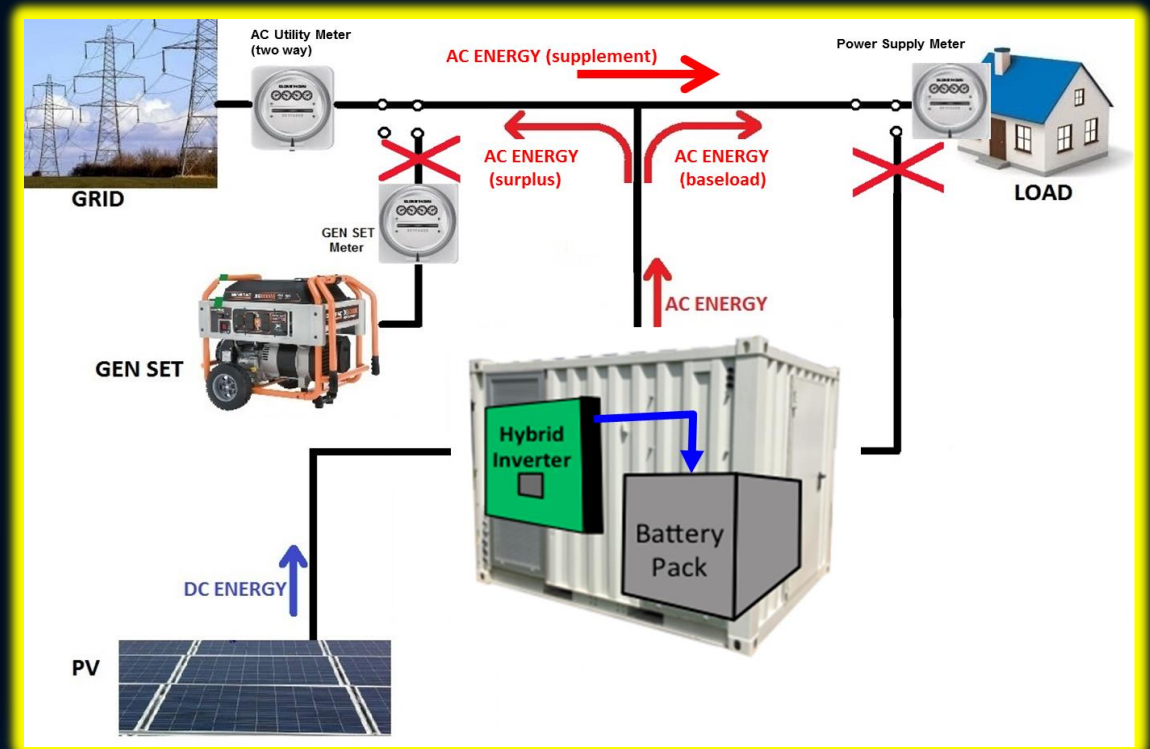
Most advanced Hybrid Inverter
6x10 kVA (three phases)



The 3 Basic Functions

A ... GRID AND PV SUPPLY

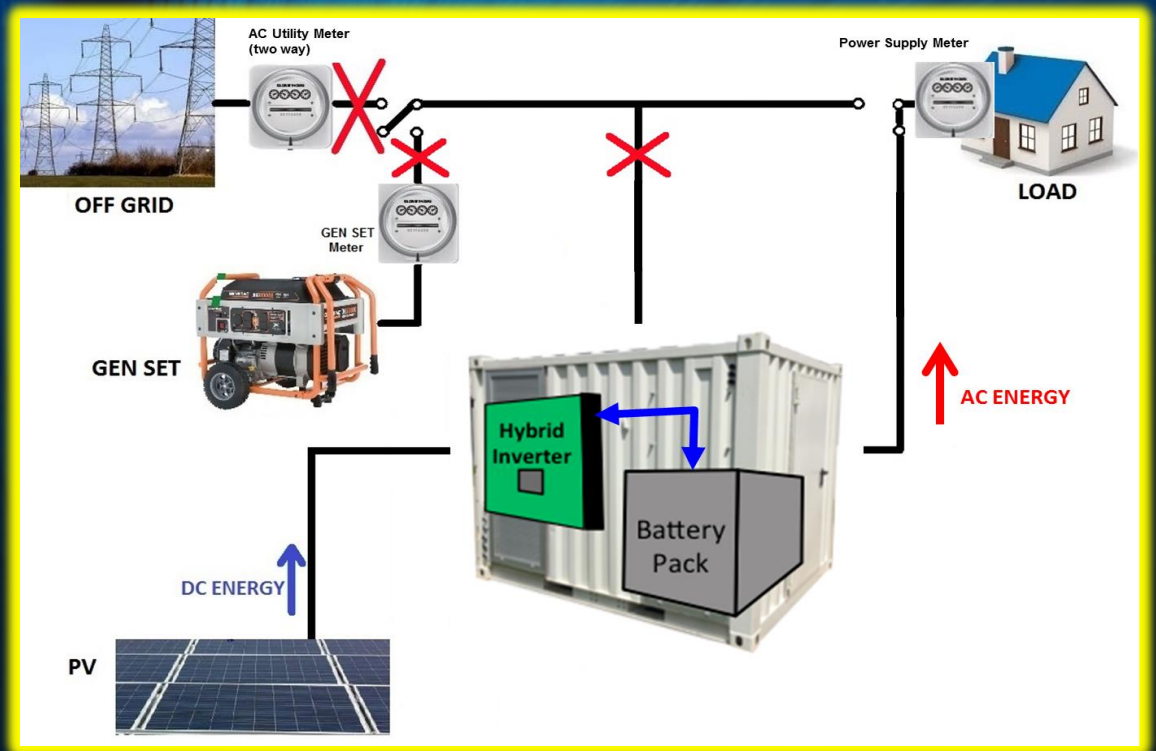
- No kWh from the PV-plant is lost
- Even with full batteries and no load
- Surplus power is feed-back to the grid



The 3 Basic Functions

B ... OFF GRID AND PV SUPPLY

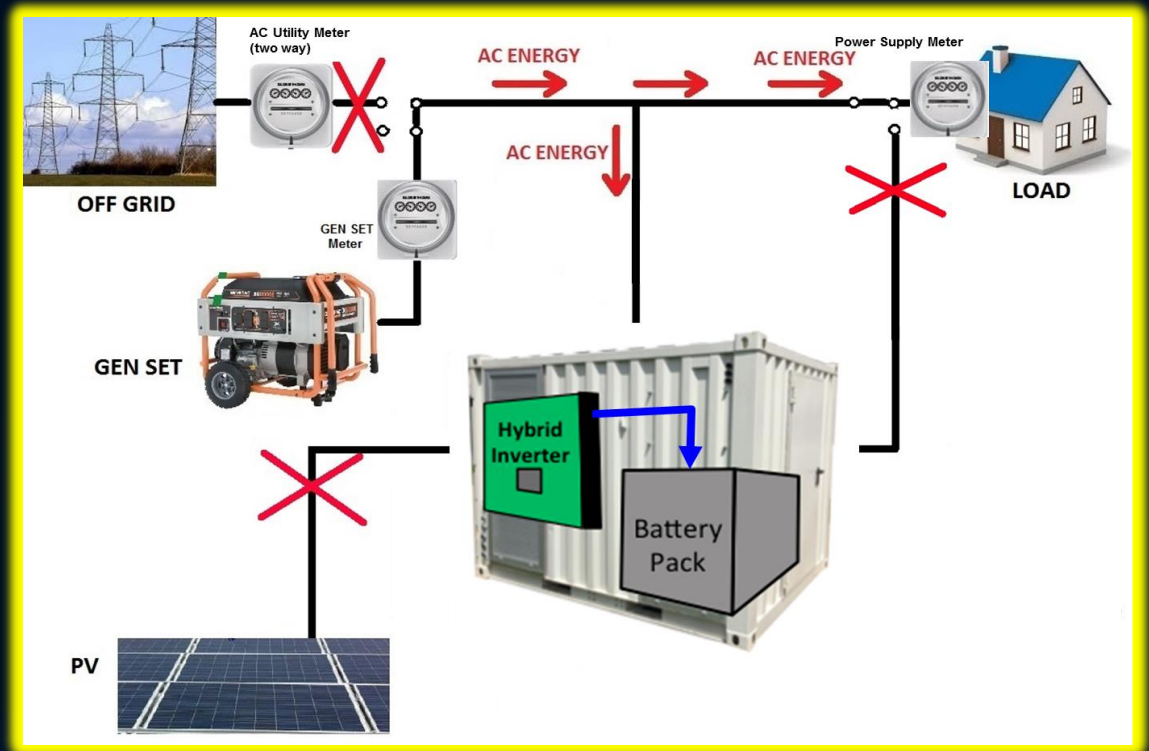
- Plentiful PV power feeds the load and the batteries
- Full batteries supply the power for off-PV periods
- The power quality will be compliant with any grid code



The 3 Basic Functions

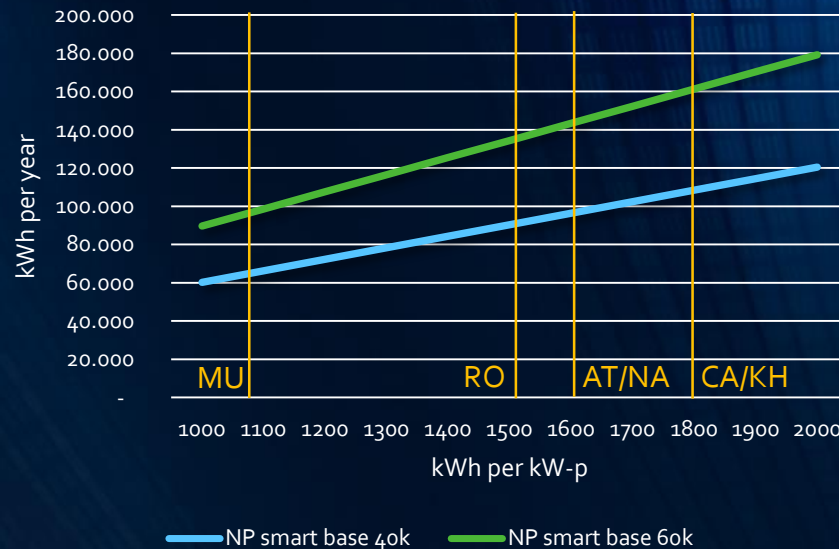
C ... BATTERIES EMPTY AND NO PV SUPPLY

- The Genset starts automatically
- The load will be supplied by sufficient power
- The batteries will be charged



Some Economics

Expected PV Yields



The PV yield does not only depend on latitude, but also on climatic conditions like rain periods

seasonal PV yield



Sample Calculation

NP smart base 60k replaces existing Genset 80 kW

- PV Production of NP smart base 60k (1.650 kWh/kW-p) 149.000 kWh / year,
- Genset 80 kW (21% load or 5,1 hours/day) 149.000 kWh / year
- Average fuel consumption (34% load) 400 g/ kWh *)
- Fuel Cost (Diesel) 0,6 EURCts/ liter
- Diesel Specific Weight 0,83 kg/ liter
- Maintenance&Repair 1,5 Cts/kWh

- ✓ Savings are $(0,33+0,015) \times 149.000 = 51.400$ EUR/year (0,33 EUR/kWh)
- ✓ Reinvestment after 4 years Genset operation not considered

*) see test results in https://www.victronenergy.com/upload/documents/VE_Marine_generator_test_RVA_07-jan-2008.pdf

The Main Features of our „Hybrid“- Series

- Plug-in ready solution
- Three main modes:
 - Grid-tied (including feedback)
 - Off-grid
 - Grid-tied with battery back-up
- Top economics
- Long life batteries (18 years design)
- High operable battery capacity (up to 168 kWh)
- High PV-capacity (up to 90,4 kW)
- Outdoor option with air condition
- Genset operation limited to charging batteries (remote start/stop) when grid is off or not existing
- Monitoring software
- LAP-Top with WLAN/Bluetooth/GSM options
- High frequency pure sine wave design
- Wide AC input range
- 4kW parallel support up to 24 kW (three phase)

"Hybrid"- Series	NPsmart base 4k inhouse plus	NPsmart base 40k	NPsmart base 60k
AC-INPUT			
AC-Input	4.000 W	40.000W	60.000W
AC-Input-Voltage	170-280V		
AC-Input-Frequency	50/60 Hz		
AC-OUTPUT			
Continuous Output	4.000 W	40.000 W	60.000 W
Max Output (grid bypass)	6.000 W	64.000 W	96.000 W
Output-Voltage	230 Vac (+/- 5%)	230 Vac (P-N) / 400Vac (P-P)	
Output Frequency	50/60 Hz		
Output Waveform	Pure Sine Wave		
Max DC/AC Conversion Efficiency	>96% line mode 92% inverter mode		
Output Short Circuit	Circuit Braker		
Batterie Storage			
Battery Type	Lead Crystal	OPzV	
Battery Voltage	48V		
Battery Capacity (C10)	8x100 Ah/12V	24x1.500 Ah/2V	48x2.500 Ah/2V
PV-input			
PV Power	5.040 W-p	60.200 W-p	90.400 W-p
PV-modules	18x280 W-p	215x280 W-p	323x280 W-p
MPP-Tracker	1	8	12
Max PV-Input V	580 Vdc	900 Vdc	
Operating Modes			
Power Sources	PV, Grid, Genset (Hybrid Mode)		
PV/Battery grid feeding-back	Yes		
General Features			
Dim. Base Station	800 x 400 x 1.400 mm	9' - Container	20' - Container
PV- area (min.)	45 m²	540 m²	800 m²
Included Equipment (plug-in ready)	Base Station, Batteries, PV-Modules, Foldable Patented Racks, DC-Wires, Connectors		
Operating Temperature	0-40°C	-10 – 50°C	
Special Features	Indoor, Fixed	Outdoor (Container/Housing), Fixed	
Operating Control	Laptop (WLAN/Bluetooth/GSM)		
Metering	Online		
Internet remote control	Yes		
Genset (optional)			
Engine Type	Gasoline / LPG / Diesel		
Genset standby	7 kW (one phase)	80 kW (three phases)	120 kW (three phases)
Automatic Start/Stop	Yes		