



Hybrid Systems

HYBRID CUBE

Oberhausen, Germany

PV-Hybrid DC Power Solutions For Unstable Grids On Telecom Wireless Sites

HOW TO

useless

b+w Experience

- Established in 1980
- Central design and manufacturing in Oberhausen
- Production of power systems opened in 1992
- **Nokia** OEM partner for power units since 1992
- Delivered over 100.000 power distribution units since 1992
- Delivered over 70.000 systems since 1992

Quality Standards: ISO 9001:2000, ISO 14001
Up to maximum 1.000 Systems per month



Broadband Access



IT Centers



Wireless Systems

b+w Experience



Headquarters, Oberhausen

b+w Experience



Production, Oberhausen

Situation On Telecom Wireless Sites

Operating costs of tower infrastructure, like diesel generators, air-conditioning equipment, and security and site rentals, form a significant portion of nearly 60% of site expenses.*



60%
of site expenses

*Source: Capgemini, Telecom, Media & Entertainment

Oil Prices Go Up

Oil prices have been on everyone's mind, having spiked 141% over the last 3 years.

Oil price performance in the last 3 years

Latest:

119.16



141%



Source: Money Week 2012 4 17

Existing Site Solution: With PV-Hybrid Power Components Adapting To Infrastructure



Site components

● **Solar Panels**
48 X 240Wp

● **Backup Batteries**
2000Ah

● **Energy Management**
System Controller
Solar Charger
15kW BTS Rectifier
DC/AC Inverter

● **Diesel Generator**
15kVA with ATS panel

● **Diesel Fuel Tank**

Case Study Nigeria: PV-Hybrid Solution Vs. Shelter 70% savings

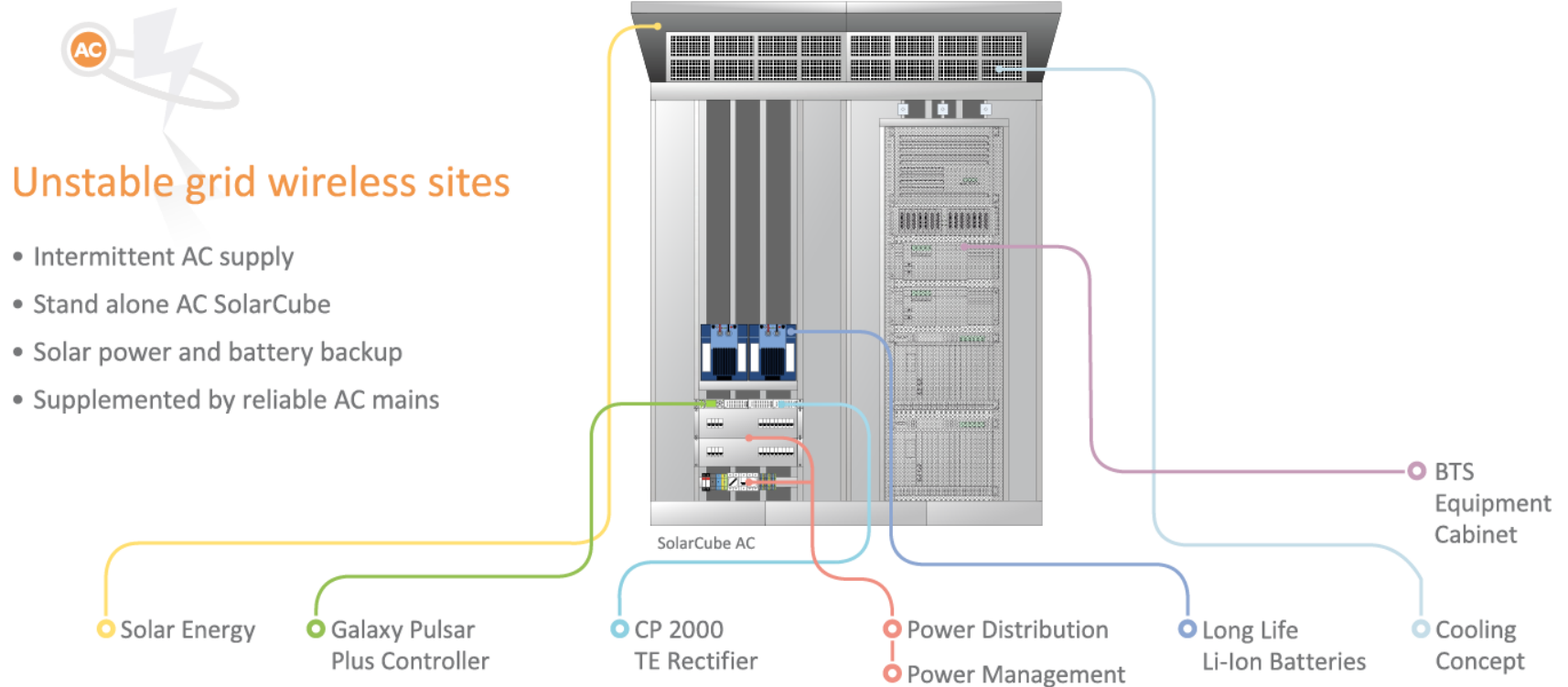
OPEX calculation shows more than 70% energy saving with a PV-Hybrid power solution vs. a shelter powered by diesel genset 24/7.



70%

energy saving

Green Field Site Solution: With SolarCube Low Energy Passively Cooled Outdoor Cabinet



Second life option

Existing BTS can be removed from conventional shelters and outdoor systems and integrated into the SolarCube to optimize operating expenses.

Outer dims w/o PV max.	2420 mm H x 1822 mm W x 1617 mm L
Outer dims with PV max.	2860 mm H x 2011 mm W x 1071 mm L
Weight	870 kg net

Case Study India: SolarCube Installation



Material lifting



Cabinet installed

Case Study India: SolarCube Installation



Equipment installed



Equipment installed in progress

Case Study India: SolarCube Installation



Final integrated cabinet with equipment

Case Study India: SolarCube Vs. Shelter

50% savings

ON GRID SITE- GSM SOLO (Solar+Battery Bank+SEB)

Details	Equipment Load (Watts)				Hrs of operation	Power Consumption / KWH/Day		Power Consumption / KWH/ Month	
	Conventional Shelter		Advanced Solar Cube			Conventional Shelter	Advanced Solar Cube	Conventional Shelter	Advanced Solar Cube
	Specs	Load in Watts	Specs	Load in Watts		KWH	KWH	KWH	KWH
BTS	BTS Incl MW	1200	BTS Incl MW	1200	24	28.80	28.80	864	864
Air con	2 TR	3200	NA	-	10	32.00		960	
Fan	NA		FCU	141	24		3.38		102
Transformer heat	NA		Isolation Trnf	17	24		0.41		12
Battery	VRLA 300Ah	83	LI-ION 42AH	23	24 Hrs Float chrg	1.99	0.55	60	
SMPS	2800W Module	2800	High Eff 1800W	1025	24	5.38	0.86	161	
Total kWh						68	34	2045	
Difference							34	1025	

161	2045
2045	1020
1025	

Note: Battery Capacity for Conventional shelter is High to cater to 8 hrs Backup. In case if Integrated shelter is having the same BB AH, the Consumption will increase by 0.35W/ Day as float charging.

Case Study India: SolarCube Vs. Shelter

50% savings



50%

energy saving

Case Study Brazil: SolarCube Vs. Shelter

87% savings



Shelter, Brazil



SolarCube, Brazil

Case Study Brazil: SolarCube Vs. Shelter

87% savings

	W	h	kWh	Shelter/Y	SolarCube/Y	Delta
Base station	600	24	14,4	5.256	5256	
Aircon	5.000	24	120	43.800	0	
Fan	100	24	2,4	0	876	
Transformer	38	24	0,91	332,9	0	
Transformer HE	17	24	0,41	0	148,9	
Battery Lead	92	24	2,2	805,9	0	
Batter Li-Ion	23	24	0,55	0	201,48	
Rectifier (losses)	60	24	1,44	525,6	0	
Rectifier LP (losses)	36	24	0,86	0	315,4	
Total kWh/Y				50.720,4	6.797,78	

-87%

Case Study Brazil: SolarCube Vs. Shelter

87% savings

OPEX calculation from EADS shows a 87% energy saving with SolarCube vs. a Shelter.



87%

energy saving

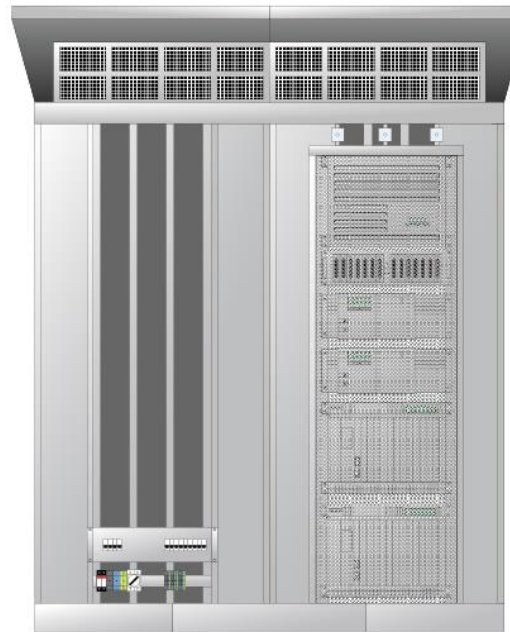
Green Field Site Solution: SolarCube + HybridCube Independent DC Power Supply

DC



Off grid wireless sites

- No AC supply available on site
- DC SolarCube plus HybridCube
- Solar power and battery backup
- Supplemented with standby DC generator



SolarCube DC



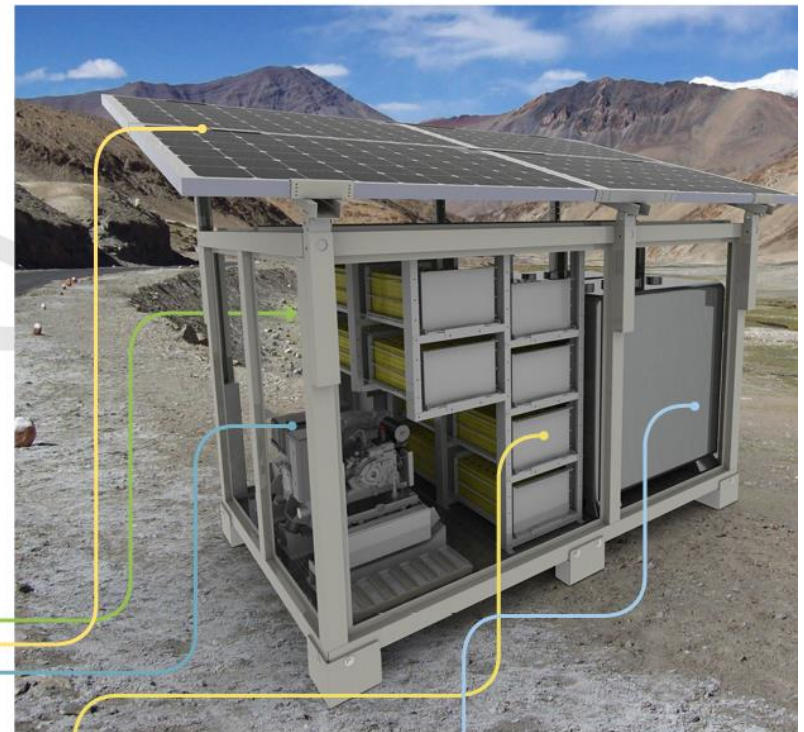
HybridCube DC

HybridCube Independent DC Power Supply

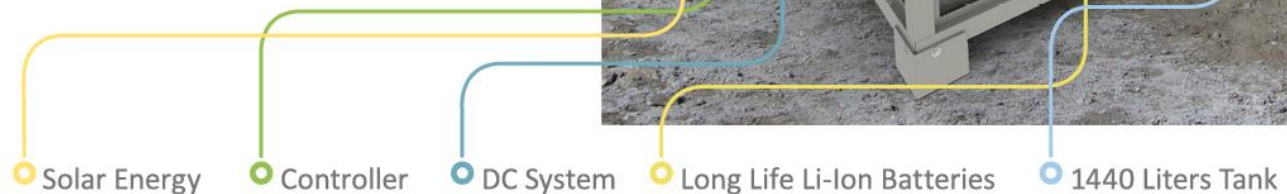
The b+w HybridCube is a compact independent off grid DC power supply system for outdoor telecom equipment utilising solar panels, diesel generator and batteries.



Outer dims w/o PV max.	1750 mm H x 2700 mm W x 1700 mm L
Outer dims with PV max.	2900 mm H x 3300 mm W x 2300 mm L
Weight	1350 kg net

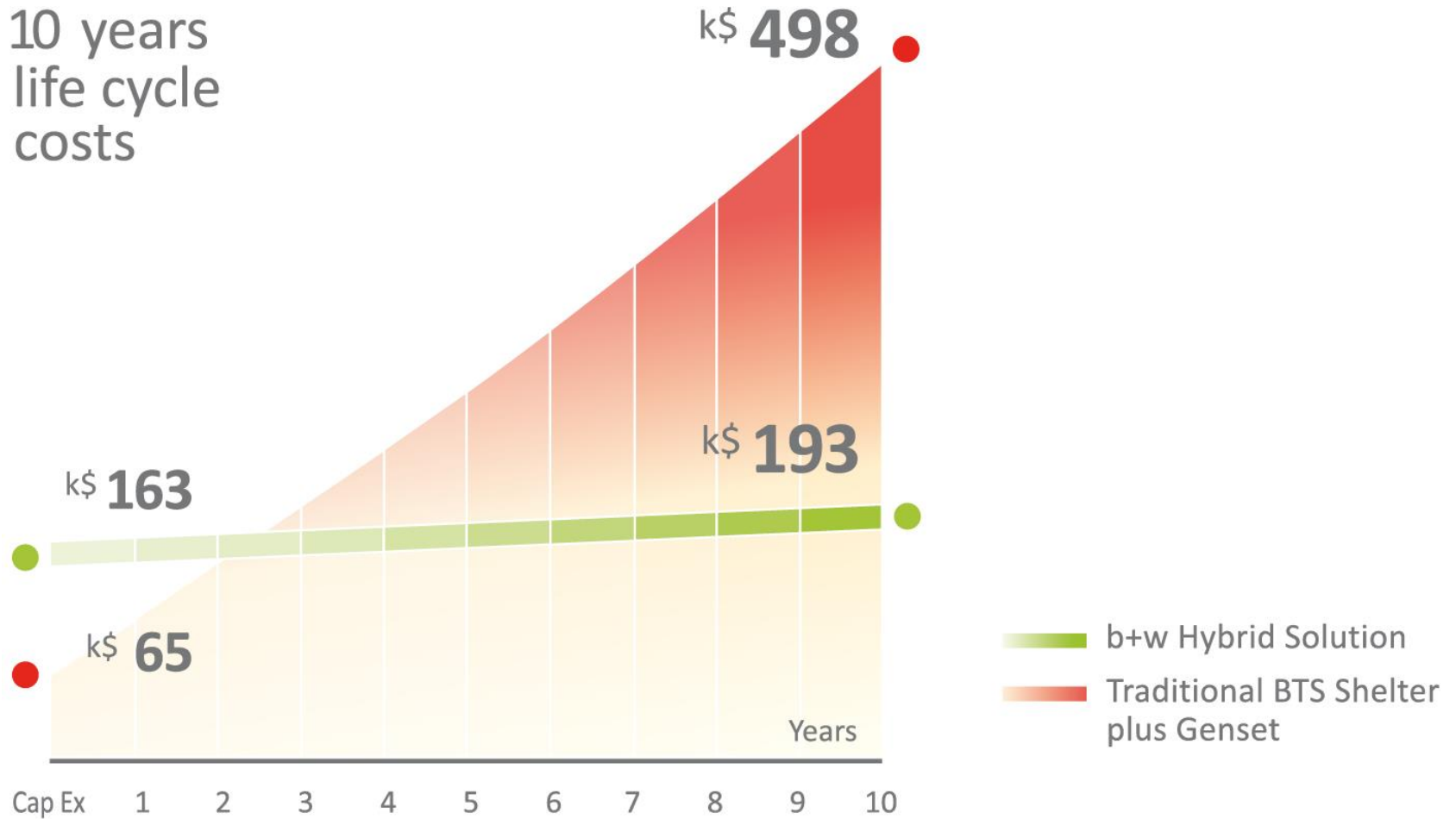


Power components



Break Even Expected At 2-3 Years

10 years
life cycle
costs



Our Solution For A Typical Green Field Telecom Tower Infrastructure



Conventional Shelters with DG Sets



HybridCube
Hybrid Power
Independent
DC PowerSupply



SolarCube
Low Energy
Passively Cooled
Outdoor Cabinet

The Customer Benefits



Extreme Temperature Suitability



High Efficiency



Long Life



Minimal Maintenance



Hybrid



CO₂ Reduction



Modularity



Small Footprint

Your questions please?



HOW TO

useless

Contact: Amalio Leon

Sales & Marketing

b+w Electronic Systems GmbH & Co. KG

Zur Eisenhuette 11

D-46047 Oberhausen

Mobile: +34 699 700 337

Mail to: amalio.leon@b-wspain.com