

Total cost of ownership considerations

Christian Wachter, Product Manager - Rohde & Schwarz
WorldDMB General Assembly, 5-6 November, 2013
Amsterdam

Definition

Total cost of ownership:

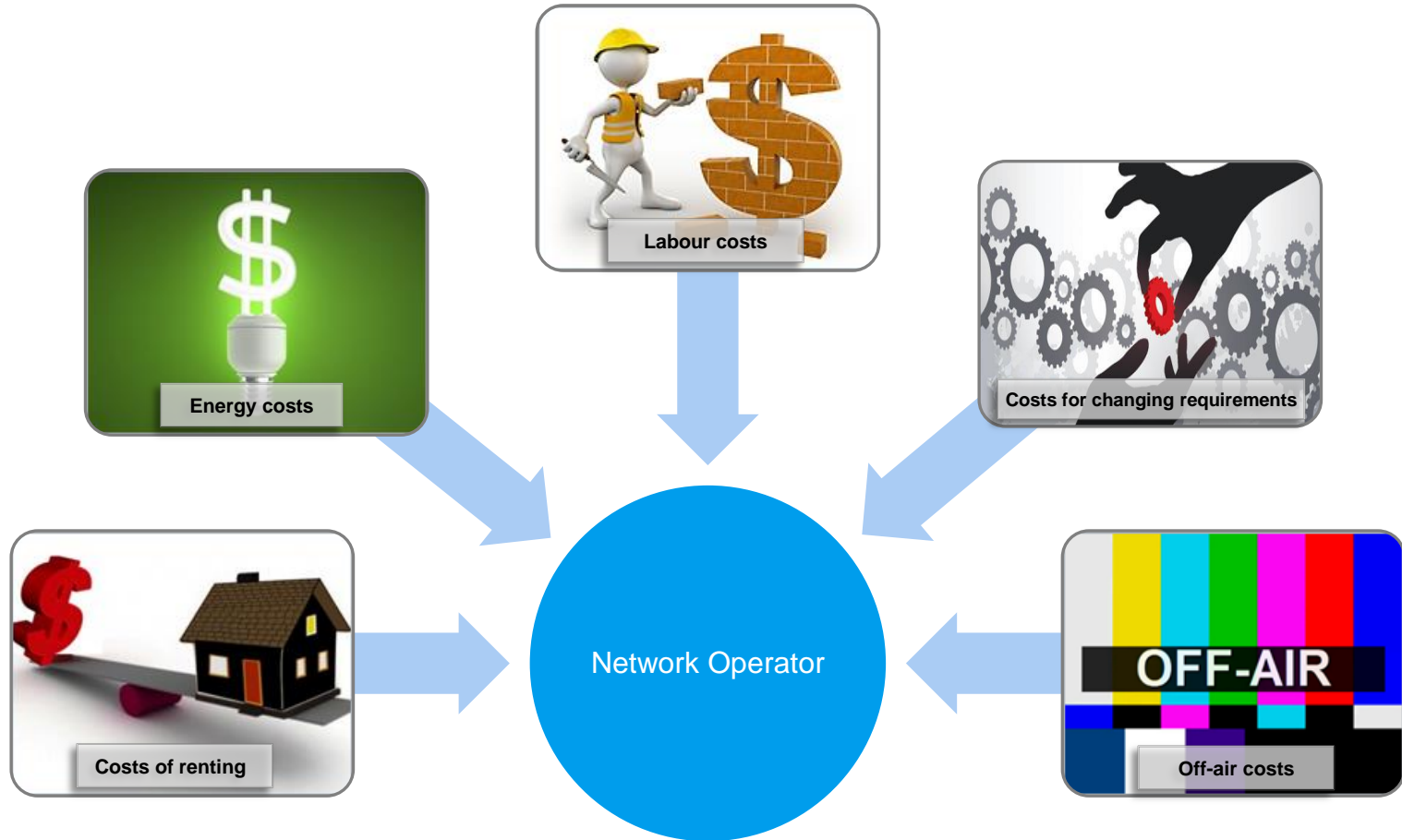
Is the estimate of all direct and indirect costs associated with an asset or acquisition over it's entire life cycle.

(source: www.businessdictionary.com)



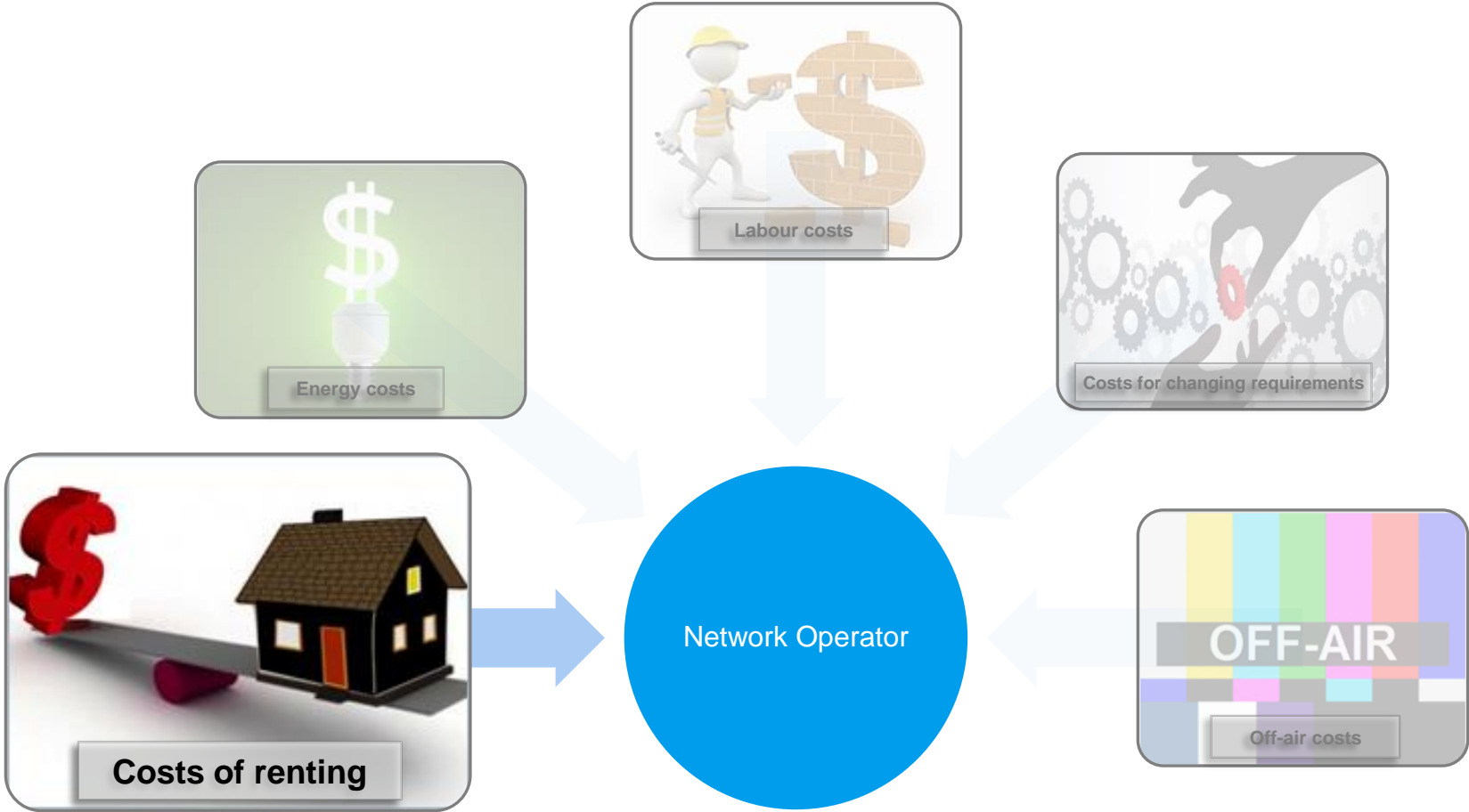
Total cost of ownership

Influencing factors other than investment costs



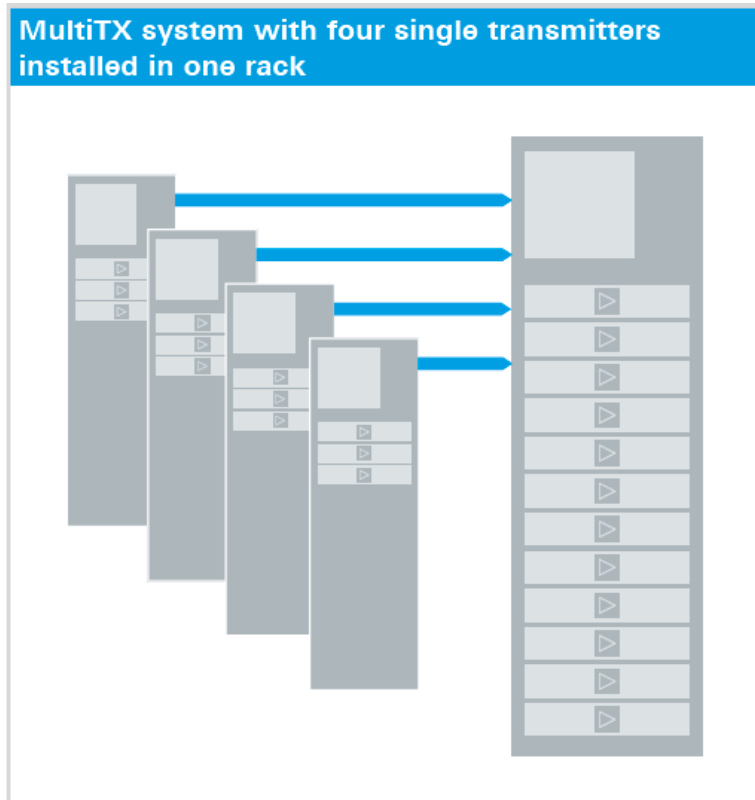
Total cost of ownership

Reducing costs of renting



Reducing costs of renting

Several transmitters in one rack



Space savings by integrating several transmitters in a single rack

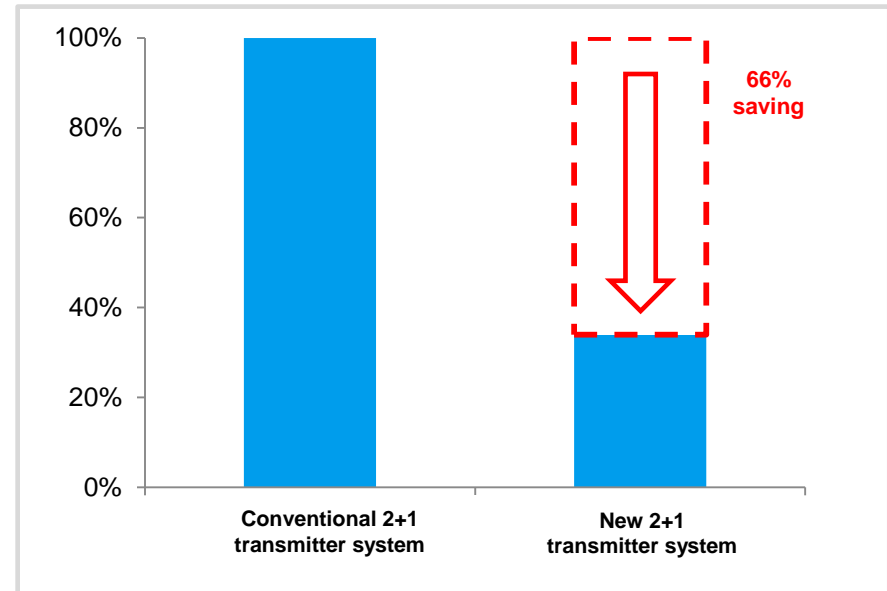


Reducing costs of renting

Exemplary calculation



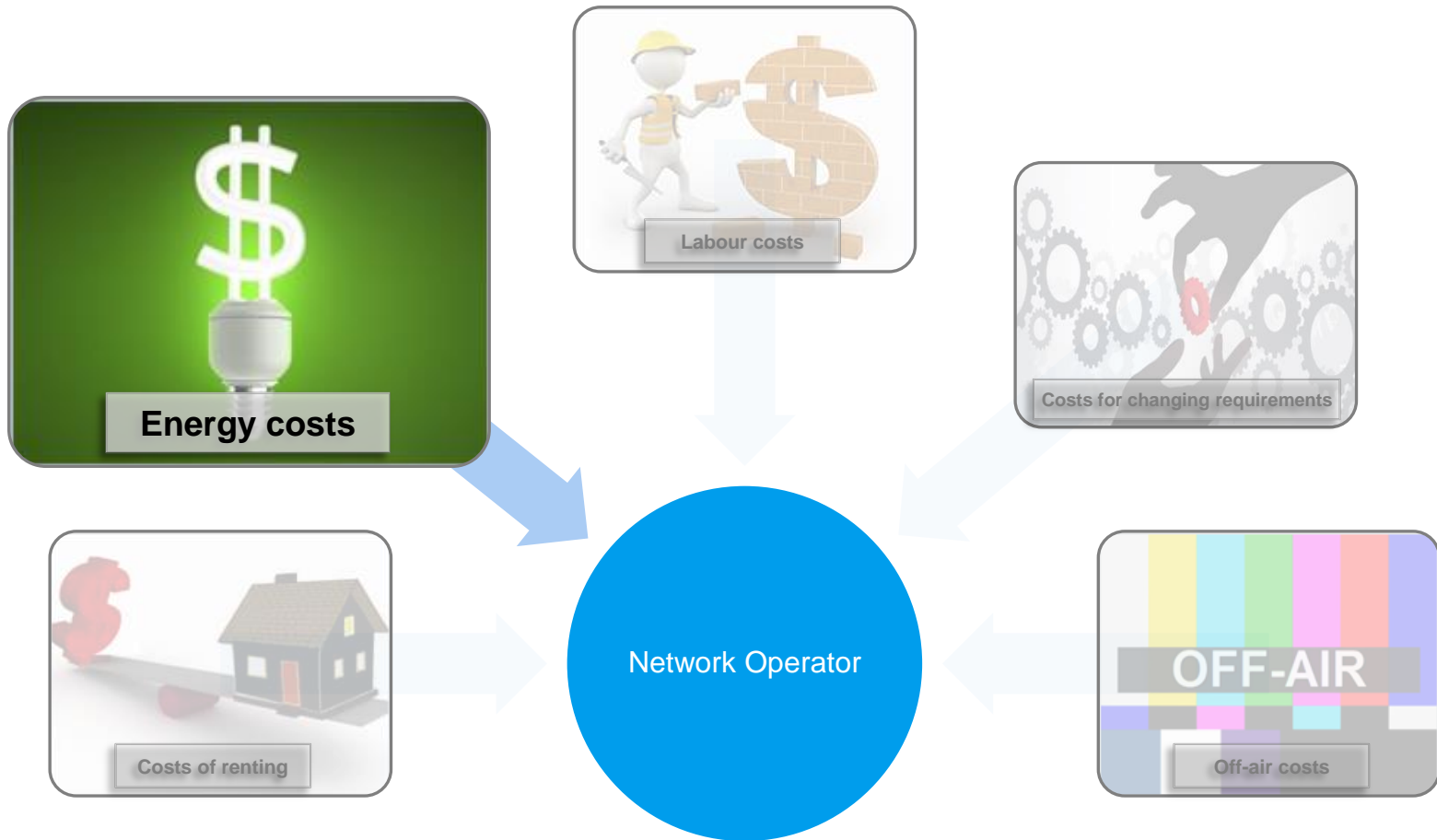
Example calculation – conventional 2+1 transmitter system vs. new 2+1 transmitter system		
	Conventional 2+1 transmitter system	New 2+1 transmitter system
m ² per system	1,44	0,48
Ø rental cost transmitter station per m ² /month	175 €	175 €
Rental cost per year	3.024 €	1.008 €
Saved rental costs in 10 years	20.160 €	



More than 66% reduction in rental costs per year in case of a 2+1 system integrated in a single rack

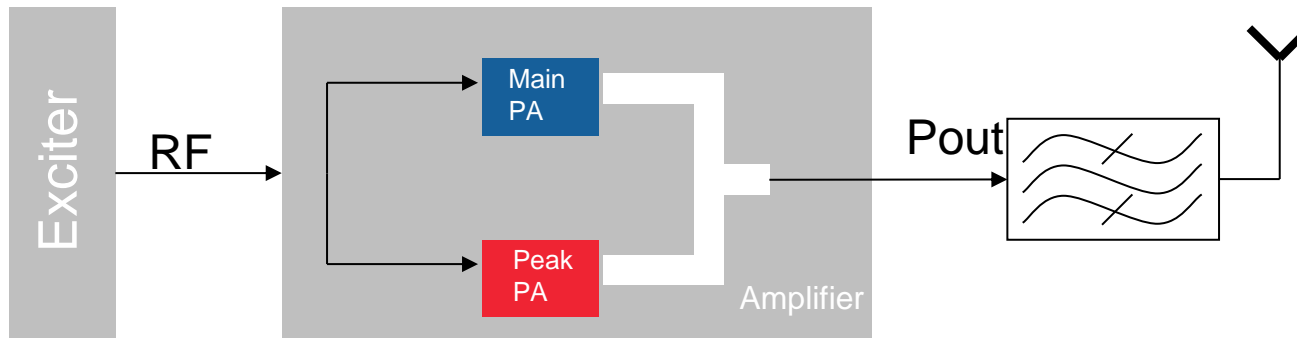
Total cost of ownership

Reducing energy costs



Reducing energy costs

Doherty technology in power amplifiers



- Amplification for main and peak signals is separated
 - Main amplifier amplifies average signals (class A/B)
 - Peak amplifier amplifies peak signals (class C)
 - lower headroom in main amplifier required
 - No energy required in peak amplifier as long no peaks are in the signal
 - Power efficiency for DAB up to 46%

Reducing energy costs

Exemplary calculation



Transmitter with Doherty technology vs. Market average air-cooled transmitter		
	Market average transmitter	Transmitter with Doherty technology
P_{out}	1.450 W	1.450 W
P_{in}	6.000 W	3.150 W
Power efficiency	24%	46%
Required energy per year (24/7)	52.500 kWh	27.500 kWh
Expected energy costs per kWh	0,12 €	0,12 €
Saved energy costs in 10 years	30.000 €	

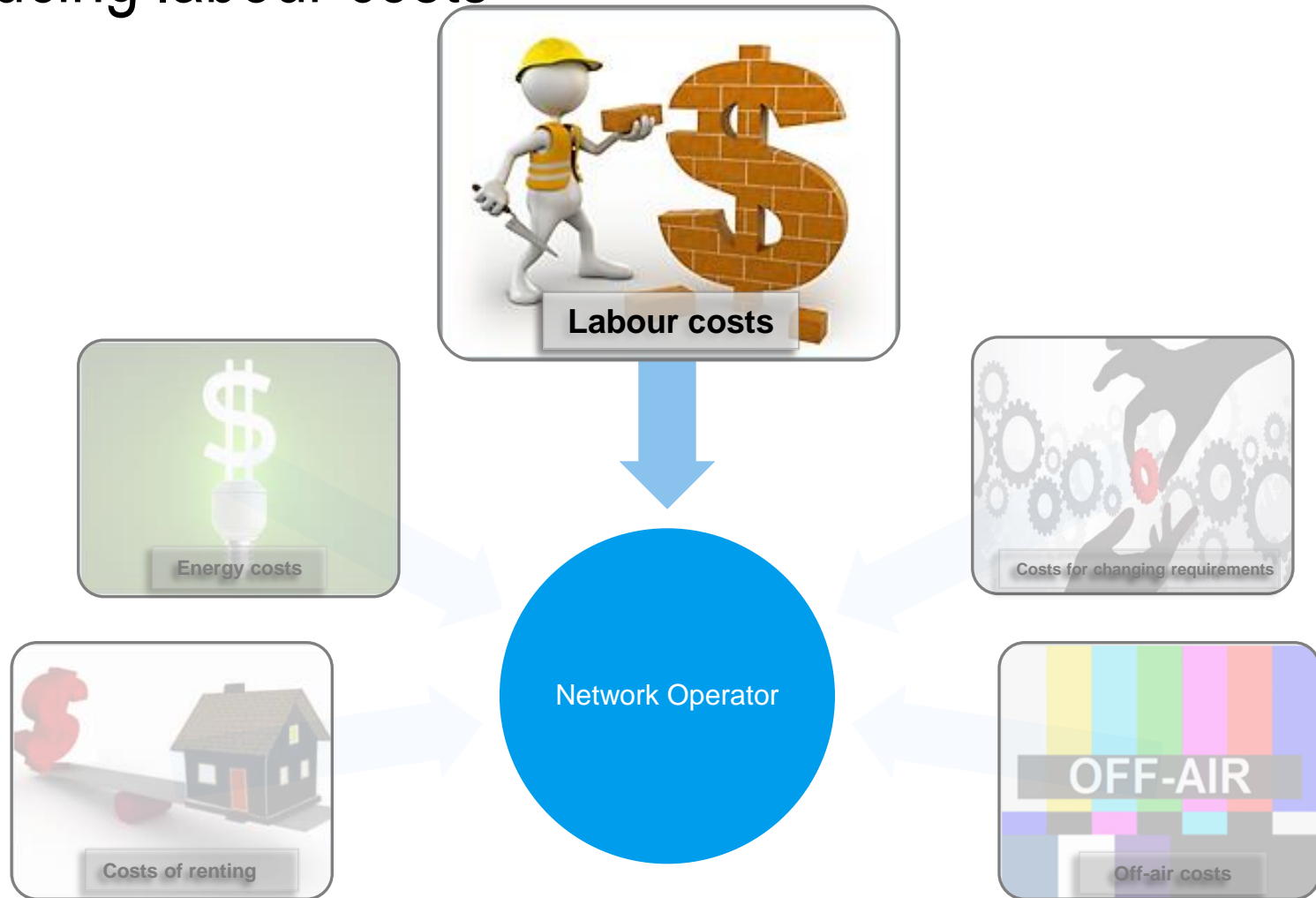
All values including cooling.

- **More than 45% reduction in energy costs**
- Significant reduction of CO₂ emissions



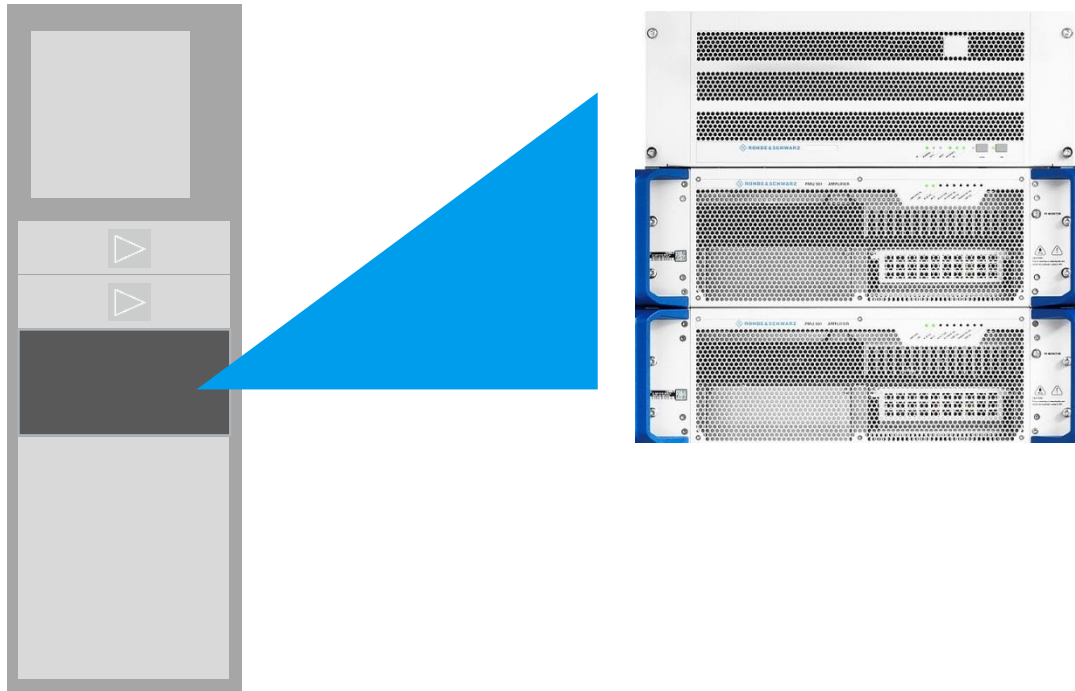
Total cost of ownership

Reducing labour costs



Reducing labour costs

Compact components for quick installation



E.g. filling existing racks with quick to install integration kits

Reducing labour costs

Intelligent diagnostics from remote

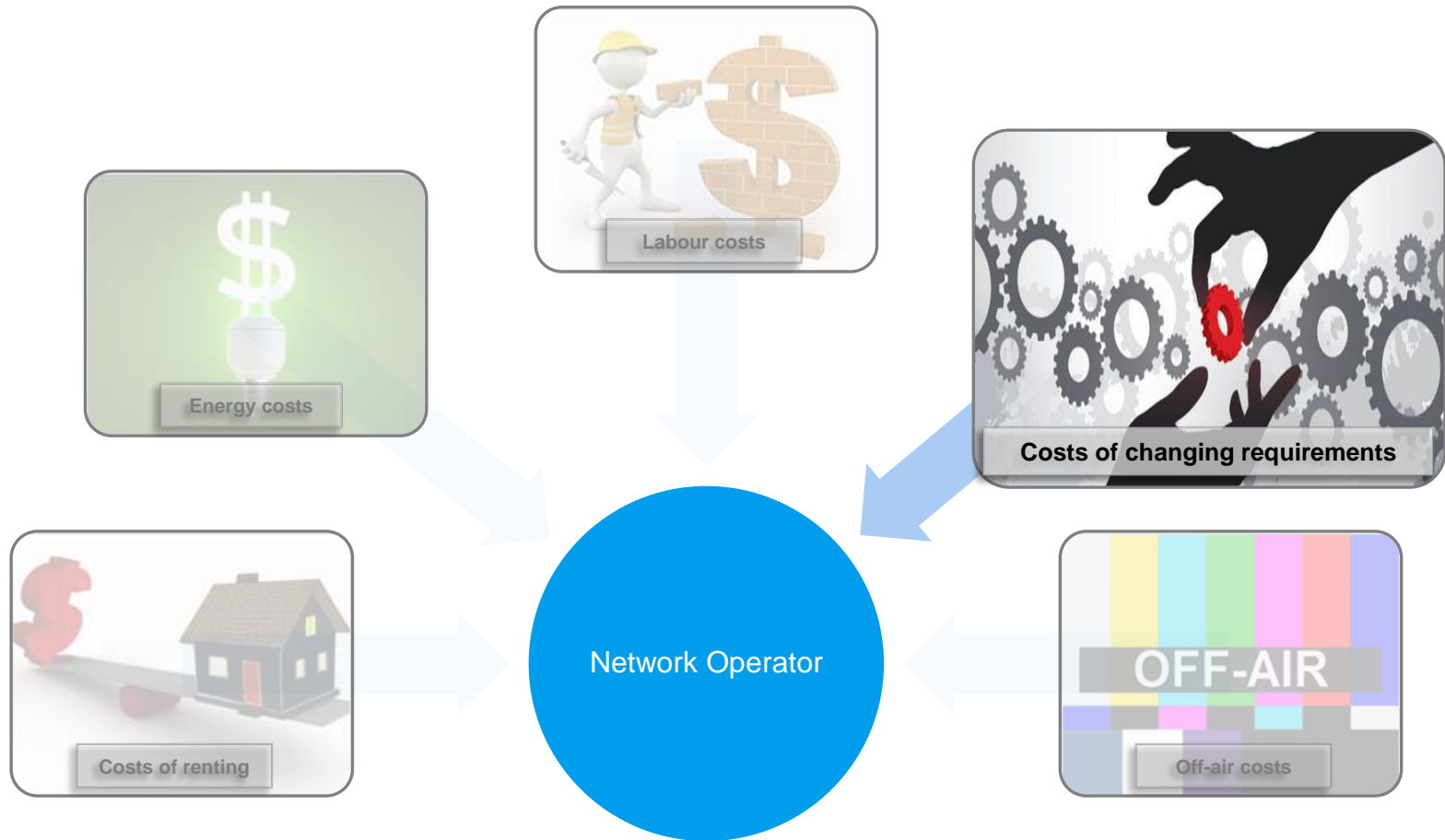


Is service on site really required?
What kind of service is required?



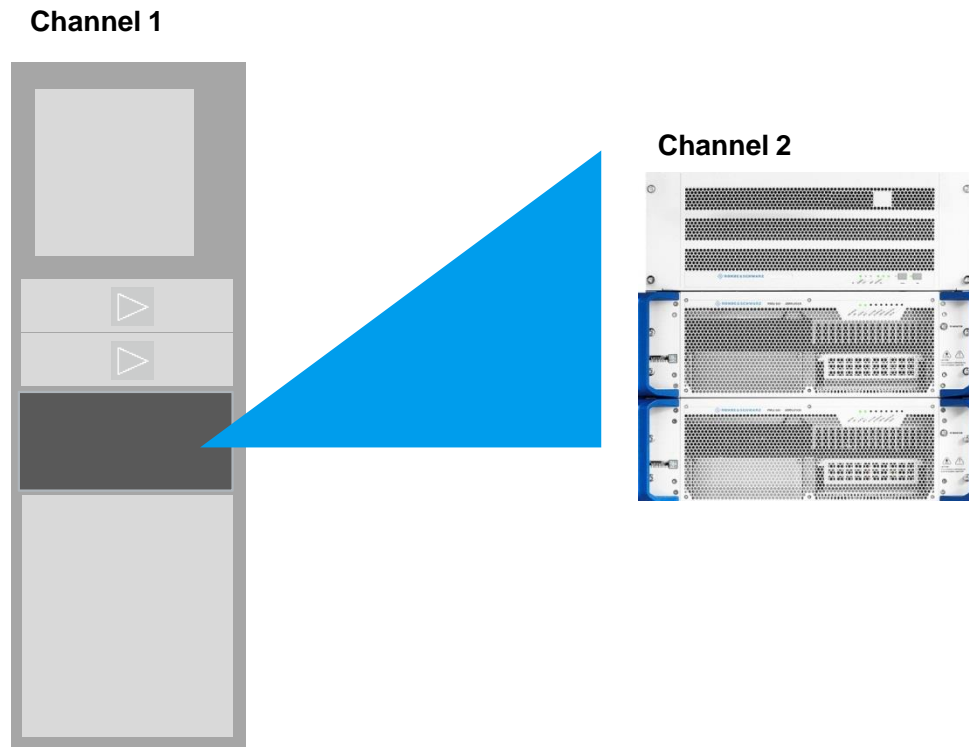
Total cost of ownership

Reducing costs for changing requirements



Reducing costs for changing requirements

Modular hardware design

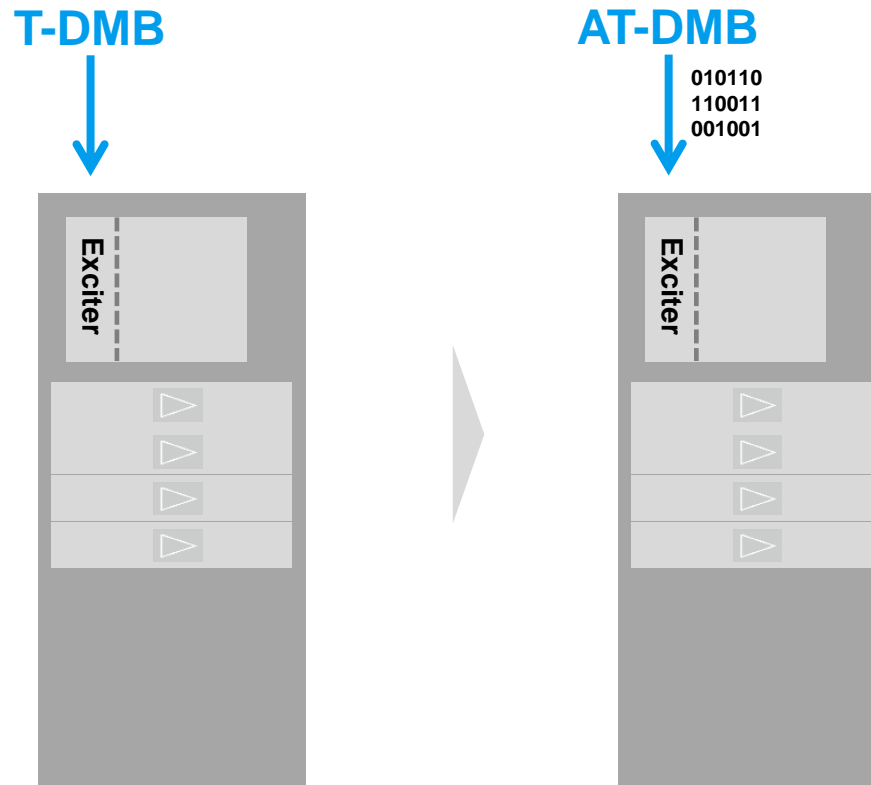


Easy upgrade to further channels



Reducing costs for changing requirements

Modular software design

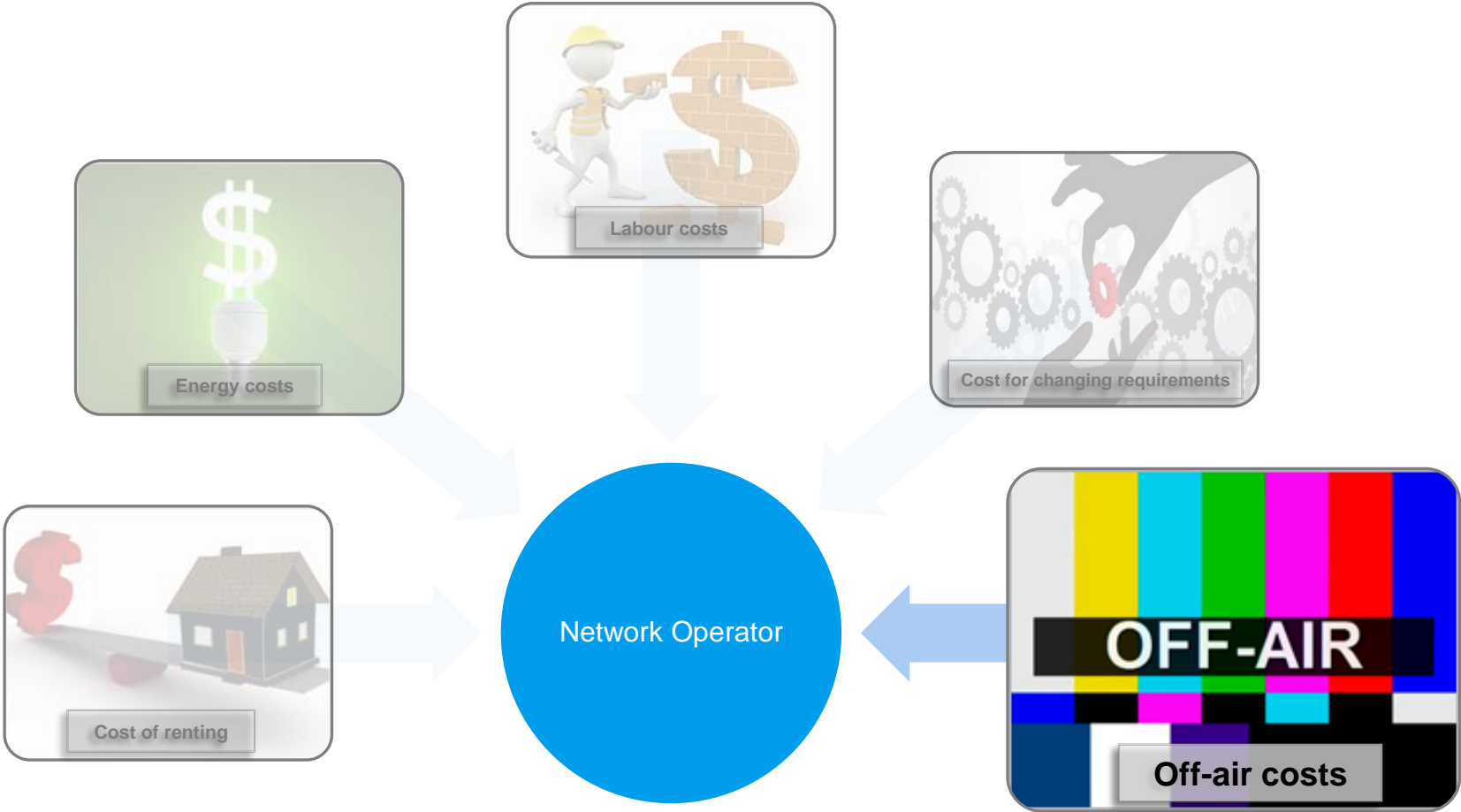


Software upgradable solutions to new standards and features



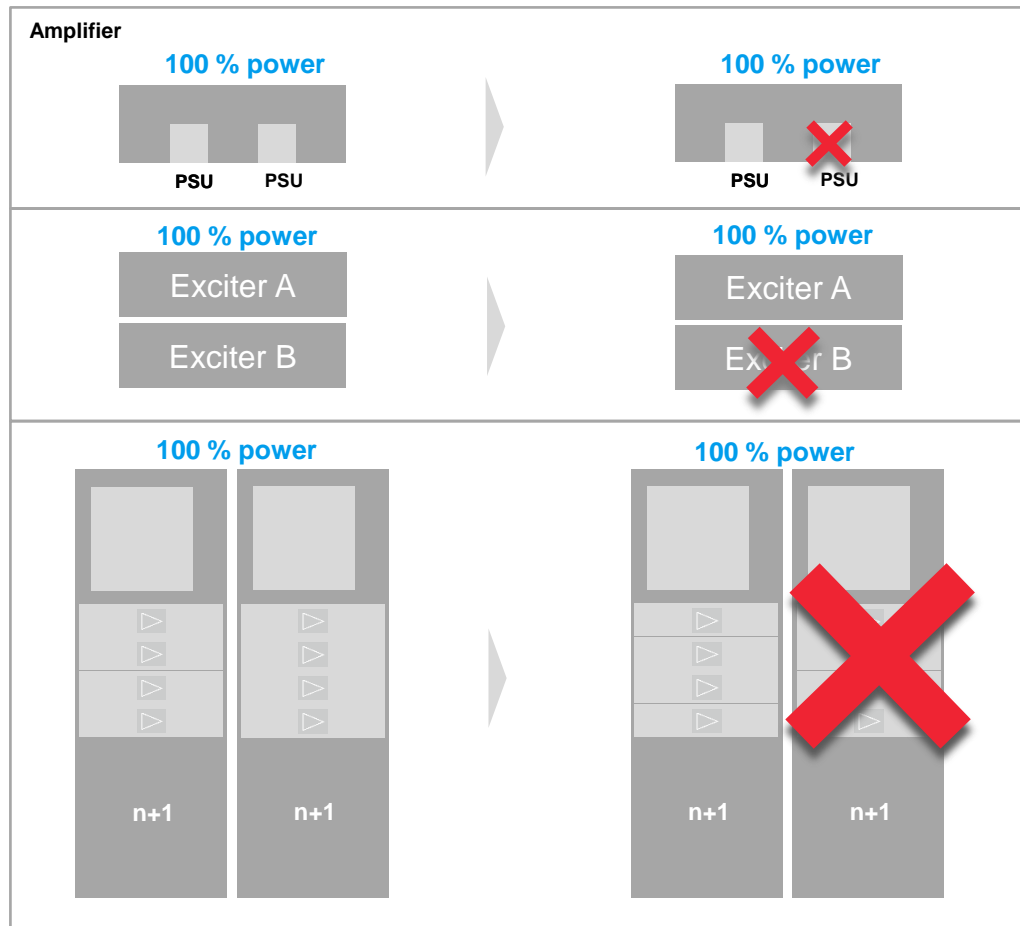
Total cost of ownership

Reducing off-air costs





Reducing costs for off-air time

Intelligent redundancy solutions



Redundancy concepts on system and components level

Rohde & Schwarz DAB transmitters overview

Medium power	High power
 <p data-bbox="571 936 790 1043">R&S[®]TMV9 Air cooled VHF transmitters</p>	 <p data-bbox="1076 936 1338 1043">R&S[®]THV9 Liquid cooled VHF transmitters</p>



Rohde & Schwarz ...we are prepared

