

# UNDERSTANDING GREEN POWER



Conserving energy has been an integral part of our DNA since the birth of Powersoft, but the mission to design and manufacture truly energy-efficient products now grows exponentially based on global warming and increasing cost of petroleum-based products.

These phenomena have produced a marketing trend that has been particularly well received in the entertainment industry where there is a special consciousness about what is environmentally friendly or "green".

Lead innovators in the events and entertainment industry have been studying a number of factors in order to determine the specific impact such events/tours have on our environment. These studies have included transportation for both bands and fans, organization and deployment (ticketing, promotional campaigns), catering and merchandise and other related phenomena.

Unfortunately, not much attention has been paid to the equipment used during such events, even though their impact represents a small percentage of the total impact of the event itself (1-4% depending on the size of the event), we feel it is more than worthwhile to focus on this side of the issue.

**Powersoft has decided to outline the importance of the ecology-efficient technologies integrated into most of our products as our contribution for preserving the environment.**

## What Does GREEN AUDIO POWER Mean?

As manufacturers of professional power amplifiers, we have always paid close attention to producing products that can minimize energy consumption, but, quite honestly, no one seems to be getting the message, especially in terms of understanding that this idea represents an economic advantage as well as a reduction of the impact of our equipment on the environment. **GREEN AUDIO POWER** is a Powersoft registered trademark that identifies environmental friendly products. This concept involves two different aspects that, when combined, represent a big leap forward in terms of the development of power amplifiers:

- Power Factor Correction (PFC) integrated into switching mode power supply
- Class D PWM (Pulse Width Modulation)high efficiency output stage



## The Power Factor Correction (PFC)

This technology is mandated in other fields because it is key to the conservation of energy and/or efficient use of the available energy. It also represents a perfect choice for both Touring equipment, where the characteristics of mains current can vary significantly from place to place and Fixed Installation equipment, where lower power levels are spread over a longer period producing a significant total energy consumption (both for the amplifiers and for the cooling system, if present).

The benefits produced by the adoption of this technology in terms of energy savings and lessening the global warming impact include: energy savings and lower carbon footprint (equivalent CO2 emissions) with a reduction of approximately 40% compared to amplifiers without power factor correction *for the same output power*.

Reduced heating generation due to cable losses due to lower RMS currents from the mains.

## Class D – PWM (Pulse Width Modulation) Output Stage

Introduced by Powersoft in 1995, this technology is becoming more and more adopted by other manufacturers and end users. The key aspect of this technology is based on extremely high efficiency that allows it to transform all the energy drawn from the mains into usable power, and to recycle the reactive energy coming back from the loudspeakers (typically, this can be very damaging for traditional linear amplifiers).

This technology produces equipment with useful features for both *touring* and *fixed install* equipment. Specifically, the main benefits of this aspect in Powersoft products are:

- Ultra high efficiency (0,95-0,99%) and consequent reduction of the required energy *for the same output power*
- Reduction of the cooling system
- Less amplifiers (with smaller size) to run the same PA system which directly impacts CO2 emissions because it in turn reduces the number of trucks required to move equipment for large events. And travel is a principal cost item for any event or tour.

## THE SCENARIOS

### *Touring*

Assuming that the necessary power for audio equipment at a live event would be roughly 180 kW. This also accounts for set-up, sound checks and a total of 6 hours running time.

**Total Required Power = 1080 kWh for each event**

Accounting for the fact that using our K-Series amplifier, the absorbed current from the mains will be reduced by approximately 40%,

**Total Saved Power = 432 kWh for each event**

Accounting for the different type of energy sources, in Italy we can find in the literature a coefficient for translating this saved energy into equivalent reduction of CO2 emissions = 260 kg for each event

If we multiply this number for the number of events that SIAE has estimated that have been carried out in Italy, we get approximately 50.000.

**TOTAL reduction of CO2 emissions = 13.000 tons**

*in Italy that is equivalent to: emissions of 6.500 cars running for 10.000 km in one year, the 0.003% of the overall Italian CO2 emissions.*

And this doesn't account for the additional side effects due to the reduction of trucks, reduction of cables' losses!

### *Fixed Installations*

Let's assume that the necessary rated audio power for a small venue with different areas (restaurant area, lounge, bar, etc.) would be roughly 6kW. Let's also assume that the program average audio power is 2.4 kW accounting for the fact that the level of the audio would be for a small percentage of the time well below the maximum. In many cases the characteristics of usage in this type of installation are a 8 hours for 365 days per year:

**Total Required Power = 14000 kWh**

If a cooling system is required, the amount of power required for this will be:

**Total Required Power for cooling system = 7600 kWh**

When using Class D amplifiers with Power Factor Correction, the savings for both aspects include:

**Total Saved Power = 4050 kWh**

**Total Saved Power for cooling system = 4050 kWh**

Assuming the type of energy sources in Italy, we can find in the literature a coefficient for translating this saved energy into:

**Equivalent reduction of CO2 emissions = 4860 kg for each installation**

Now, just multiply this figure for the total amount of fixed install of the same size!

**GREEN AUDIO POWER.  
OUR CONTRIBUTION FOR A BETTER WORLD.**



GREEN AUDIO POWER =



LESS CARBON



LESS FOOTPRINTS =



THINK GREEN  
SPARE CASH SAVE THE PLANET