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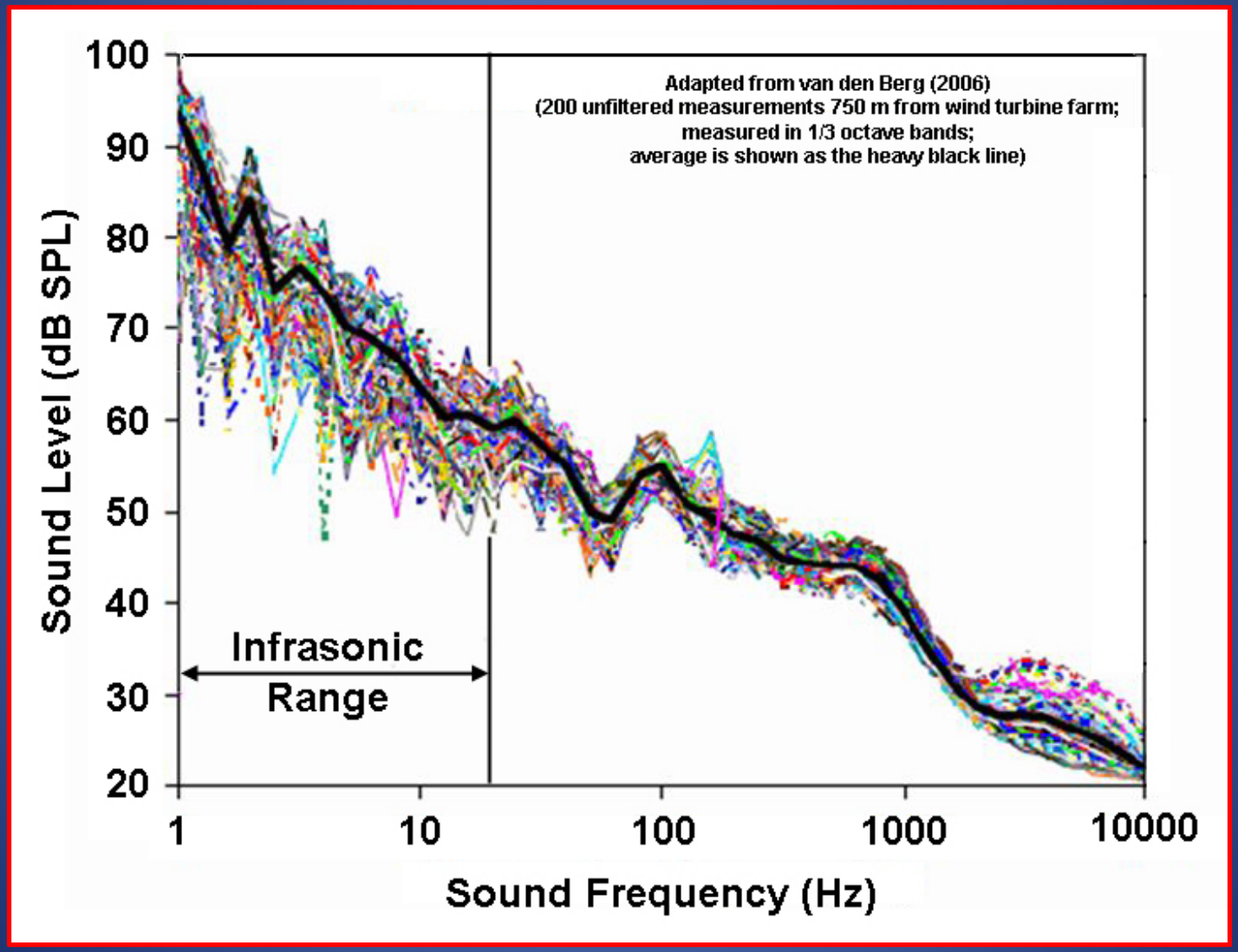
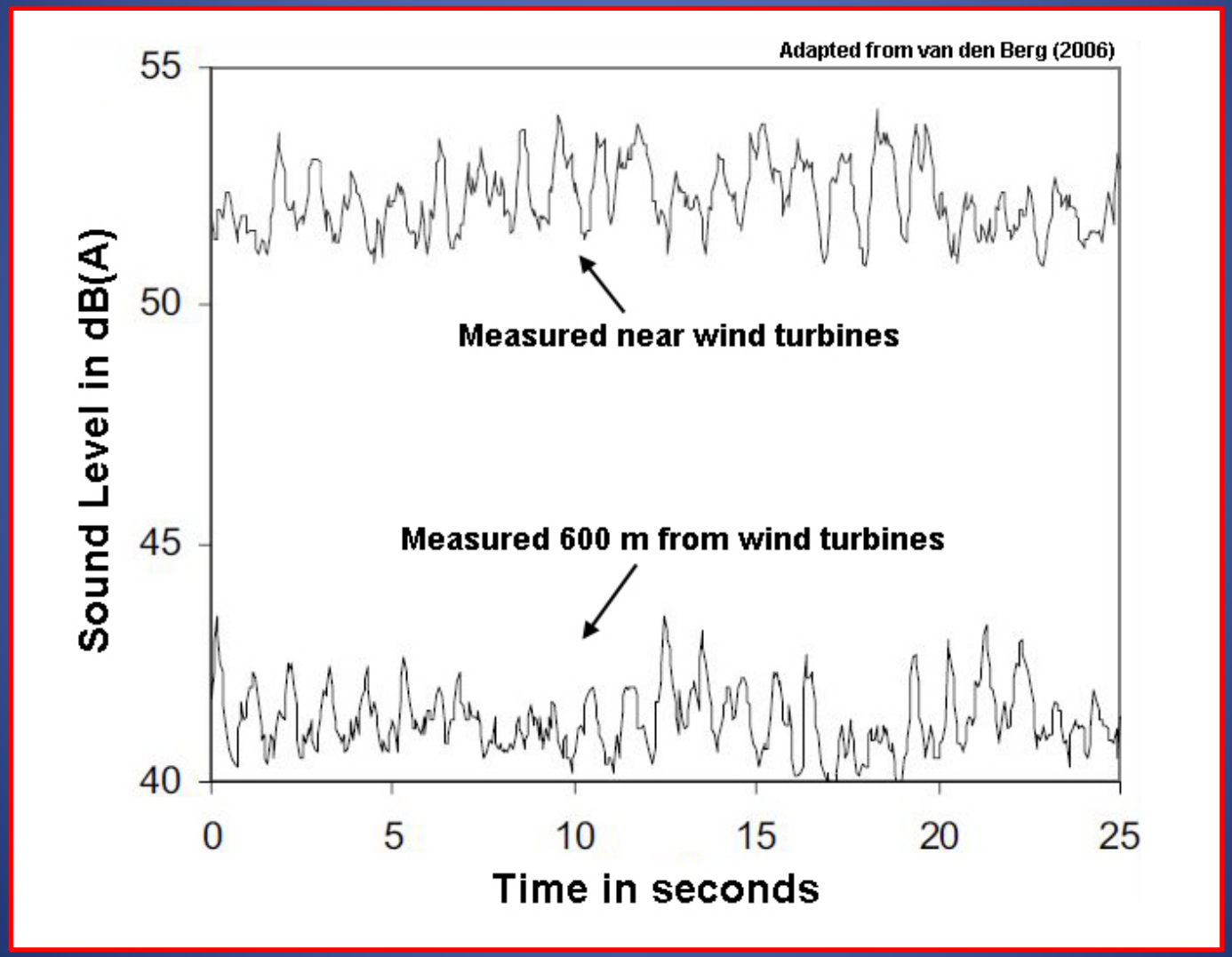
Could it be that it is what you don't hear that might be worth paying attention to when it comes to considering wind turbine farm noise?

From: greenenergysolutionsnc.com

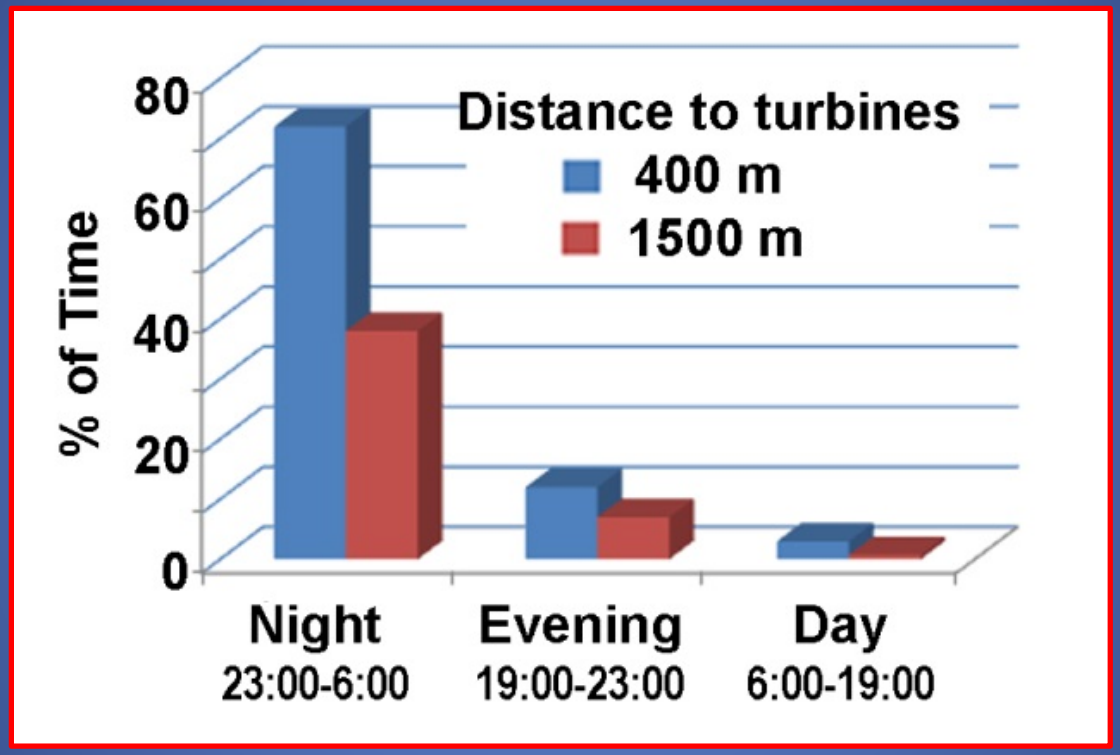
Most energy generated by wind turbines is in the infrasonic range



Audible Pulsating Sounds Caused by Interaction of Wind Turbines



Percentage of time that wind turbines are the dominate sound source



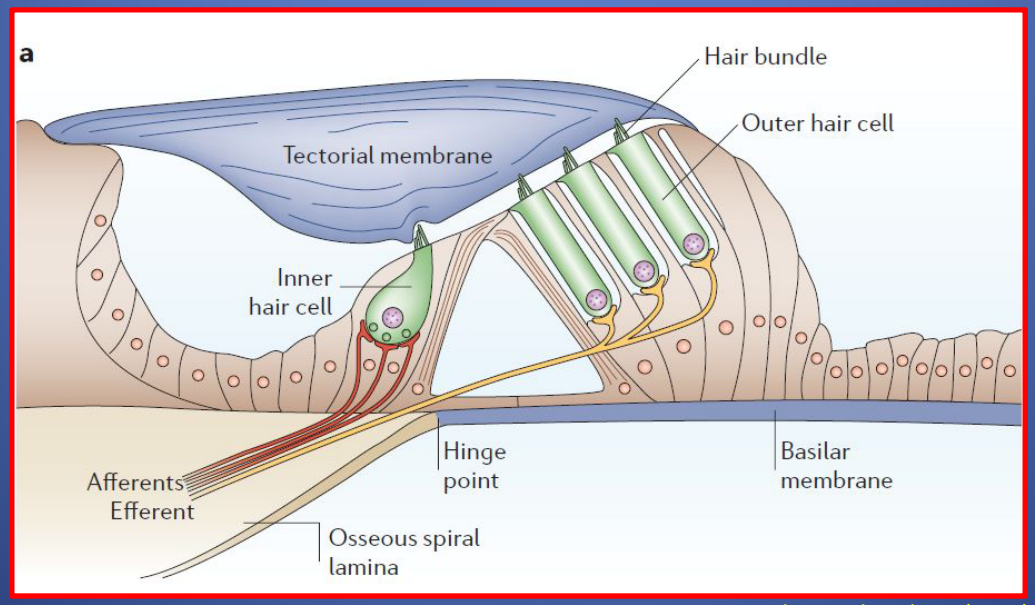
Adapted from van den Berg (2006)

The percentage of time that wind turbines are the dominant sound source correlates with the time that residents complain about turbine noise and with more complaints from residents who reside closer to wind farms.

As shown in this image of the hearing organ, two types of sensory cells, known as hair cells, have been identified and characterized.

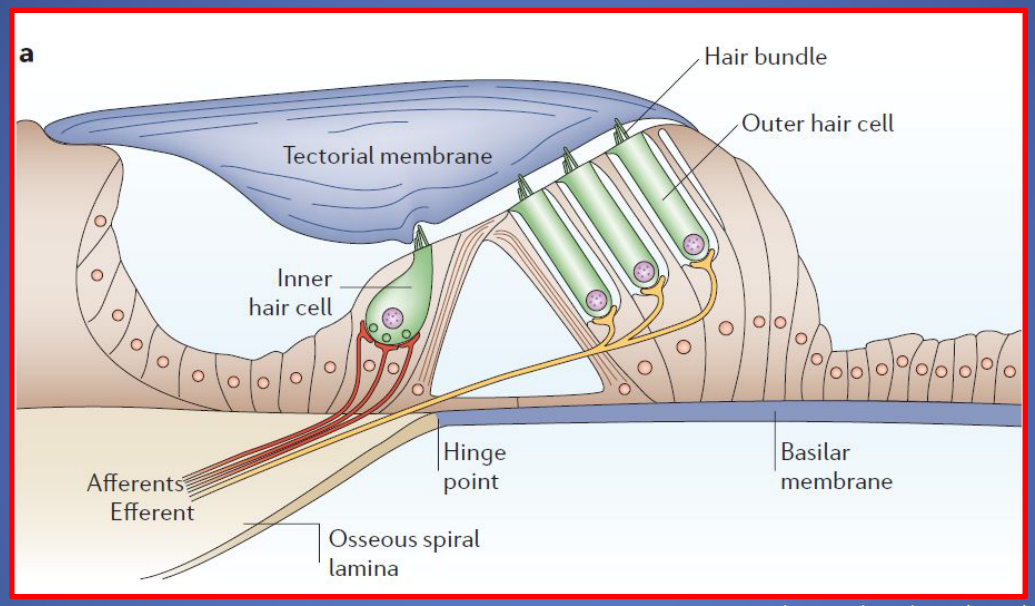
Inner hair cells (the short, stubby flask shaped cells depicted below) respond to sound and pass information about the detected sound to auditory nerve fibers (red “Afferents” in the image below) that project into the normal auditory processing centers in the brain.

When inner hair cells are activated, the activating sound is audible and this aspect of hearing is well understood.



Fettiplace and Hackney (2006)

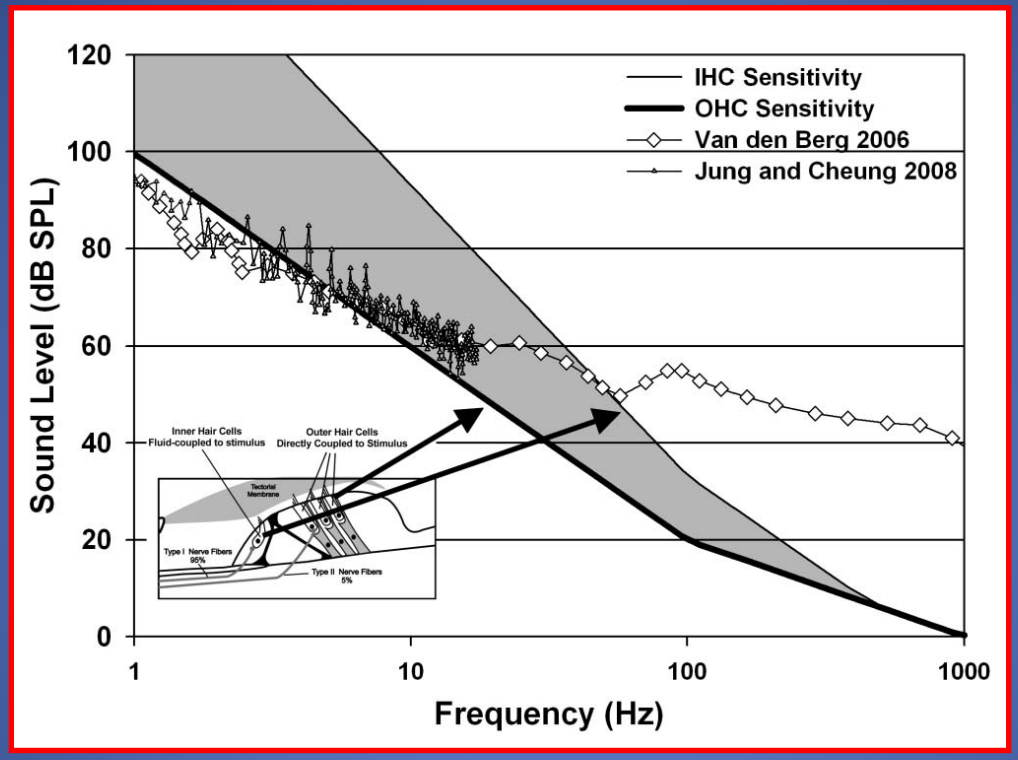
Outer hair cells (the slender, cylindrical sensory cells depicted below) are specialized sensory cells that also respond to sound.



Fettiplace and Hackney (2006)

However, outer hair cells are more sensitive to low frequency and infrasonic sounds than inner hair cells (see following slide) and they pass information about detected sounds to another type of auditory nerve fiber that project into an alternate brain circuit that is less understood than the normal sound processing pathway.

Spectrum of Noise Produced by Wind Turbines Compared to Sensitivities of Inner Ear Sensory Cells



Salt and Kaltenbach (2011)

Because outer hair cells (OHC) are more sensitive to low and infrasonic sound than inner hair cells (IHC), low frequency sounds can, and do, stimulate the inner ear (outer hair cells), but responses are, or can be, inaudible – it is the sound that you don't hear, but that activates the inner ear that is of interest in the debate over wind turbine noise production and human health and welfare.

Correlation versus Causality

The greatest challenge facing the scientific community on this question is to apply the scientific method to objectively and experimentally determine if wind turbine noise "causes" adverse health effects in humans and other animals.

This will take time!

In this light, we would suggest the formulation of a governmental policy to promote safe wind turbine farm development and simultaneously protect the health and welfare interests of animals, prominently including humans. This effort should be grounded in our current understanding of auditory science and the impact of noise on human and non-human animals.