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## **LESSON 1: Direct Energy Weapons**

DOD defines directed energy weapons as those using concentrated electromagnetic energy, rather than kinetic energy, to “incapacitate, damage, disable, or destroy enemy equipment, facilities, and/or personnel.”<sup>3</sup> Direct Energy weapons include high-energy laser (HEL) and high-powered microwave (HPM) weapons.

A Directed Energy Weapon (DEW) emits a surge of energy capable of disabling a target such as electronics in vehicles, communications equipment, or other weapons. Some applications of directed energy weapons to solve today’s challenges have already been described, such as stopping swarms of small adversary boats which have been harassing U.S. ships in international waters or stopping vehicles carrying improvised explosive devices at a safe distance from U.S. personnel. As another example, high energy lasers could be used to protect forward-deployed troops and bases from attacks by swarms of unmanned aircraft carrying explosive devices.

Directed energy weapons (DEWs) are ALSO defined as electromagnetic systems capable of converting chemical or electrical energy to radiated energy and focusing it on a target, resulting in physical damage that degrades, neutralizes, defeats, or destroys an adversarial capability.

A Direct Energy Weapon as defined by Direct Energy Weapons Agency is any weapon, device or electronic that uses any kind of energy to disable, harass, assault, incapacitate another human being, an enemy’s weapons, their equipment, hideouts, etc. For ex. Directional sound.

### **Sources:**

- ❖ Federation of American Scientists, <https://sgp.fas.org/crs/weapons/R46925.pdf>
- ❖ National Defense University, By Henry “Trey” Obering, III  
[https://ndupress.ndu.edu/Portals/68/Documents/prism/prism\\_8-3/prism\\_8-3\\_Obering\\_36-46.pdf](https://ndupress.ndu.edu/Portals/68/Documents/prism/prism_8-3/prism_8-3_Obering_36-46.pdf)
- ❖ Office of Naval Research, DIRECTED ENERGY WEAPONS: COUNTER DIRECTED ENERGY WEAPONS AND HIGH ENERGY LASERS,  
<https://www.nre.navy.mil/organization/departments/aviation-force-projection-and-integrated-defense/aerospace-science-research-351/directed-energy-weapons-cdew-and-high-energy-lasers>
- ❖ Explain That Stuff, Directional Loudspeakers, <https://www.explainthatstuff.com/directional-loudspeakers.html>