

# **Directed Energy Weapons Market by Technology (High Energy Lasers, High-power Radio Frequency, Electromagnetic Weapons, Sonic Weapons), Platform (Land, Airborne, Naval, Space), Application, Product, Range and Region - Global Forecast to 2027**

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## **Abstracts**

The directed energy weapon market is projected to grow from USD 5.3 Billion in 2022 to USD 12.9 Billion by 2027, at a CAGR of 19.6% from 2022 to 2027. Increasing demand for modern weapons to conduct successful combat operation and rising development of compact DEW for UAV platforms to drive market growth during the forecast period.

A directed energy weapon (DEW) is a ranged weapon that damages its target with highly focused energy, including laser, microwaves, and particle beams. Potential applications of this technology include weapons that target personnel, missiles, vehicles, and optical devices. In US, the Pentagon, Defense Advanced Research Projects Agency (DARPA), the Air Force Research Laboratory, US Army Armament Research Development and Engineering Center, and the Naval Research Laboratory are researching directed-energy weapons and railguns to counter ballistic missiles, hypersonic cruise missiles, and hypersonic glide vehicles.

A DEW is a future weapon system that emits highly focused energy for target destruction. The potential applications of this advanced technology include anti-personnel weapon systems, missile defense systems, and disabling of lightly armored vehicles.

A key driver propelling the growth of the global DEW market is the defense of chemical, biological, radiological, and nuclear materials so that civilian lives and the national security of a country can be preserved. DEW equipment like lasers, radiation detectors,

and biosensors are being used to defend against chemical, biological, radiological, and nuclear (CBRN) emergencies. Training fire department personnel, police, and paramilitary forces to use these weapons will help them be more effective in performing their roles. These factors will lead to the purchase of different types of DEW and result in the growth of the global DEW market during the forecast period.

Based on technology, high energy laser segment is projected to lead the directed energy weapons market during the forecast period

Based on technology, the directed energy weapon market has been segmented into high energy laser (HEL), high-power microwave (HPM), electromagnetic weapons, and sonic weapon. HEL segment witness significant growth during the forecast period. A laser is a device that emits light through a course of optical amplification based on the stimulated emission of electromagnetic radiation. A laser is different from other sources of light as it emits light that is coherent. Spatial coherence allows a laser to be focused on a tight spot, enabling applications such as directed energy weapon systems. A large amount of focused energy is delivered by high-energy lasers to a faraway target at the speed of light, thereby causing structural and incendiary damage. High-energy laser systems use photons, or light particles, to carry out military missions and civil defense. This directed energy technology enables the detection of threats, tracking during maneuvers, and positive visual identification to defeat a wide range of threats, including unmanned aerial systems, rockets, artillery, and mortars.

Based on application, military segment to witness higher growth during forecast period

Directed energy weapon market divided into military and homeland security. The directed energy weapons market for the defense segment is estimated to witness a high growth rate as compared to the homeland security segment. The need to protect against different types of threats, which may require a qualitatively different response and force, has fueled the growth of the directed energy weapons market. Technological upgrades of existing products and new product launches are also key factors influencing market growth.

The North America region dominated the market with largest share in 2022

North America is estimated to account for largest share in 2022. This growth can be attributed to the need to counter the rising terrorist activities and the consequent implementation of various military equipment modernization programs expected to propel major defense manufacturers of the region to develop more techno-efficient

directed energy weapons.

The North American directed energy weapons market includes US and Canada. US contributed the largest share to the directed energy weapons market in 2022 due to the increased demand for high-energy laser systems and high-power microwave systems in the country on its military bases in overseas deployment. This region is expected to witness a significant increase in research & development activities, particularly in high-energy laser system technologies.

The break-up of the profiles of primary participants in the directed energy weapon market is as follows:

By Company Type: Tier 1–35%; Tier 2–45%; and Tier 3–20%

By Designation: C Level Executives–35%; Directors–25%; and Others–40%

By Region: Asia Pacific–30%; North America–40%; Europe–20%; and Rest of the World–10%

Major players in the directed energy weapon market are Raytheon Technologies Corporation (US), Northrop Grumman Corporation (US), Lockheed Martin Corporation (US), Thales Group (France), and BAE Systems plc (UK). These companies adopted strategies including new product launches, new service launches, contracts, partnerships, agreements, collaborations, and expansions. Also focusing on expanding distribution networks in North America, Europe, Asia Pacific, and Rest of the World in turn driving the demand for directed energy weapon market.

## Research Coverage

This research report categorizes classified the directed energy weapon market into platform, application, range, technology, product, and region. The directed energy weapon market has been studied for North America, Europe, Asia Pacific, and Rest of the World.

The scope of the report covers detailed information regarding the major factors, such as drivers, restraints, challenges, and opportunities, influencing the growth of the directed energy weapon market. A detailed analysis of the key industry players has been done to provide insights into their business overviews; solutions and services; key strategies;

contracts, joint ventures, partnerships & agreements, acquisitions, and new product launches associated with the directed energy weapon market. Competitive analysis of upcoming startups in the directed energy weapon market ecosystem is covered in this report.

### Reasons to Buy this Report

This report is expected to help market leaders/new entrants with information on the closest approximations of the revenue numbers for the overall directed energy weapon market and its segments. This study is also expected to provide platform-wise information, wherein different DEW technology is used for different platforms. This report aims at helping the stakeholders understand the competitive landscape of the market, gain insights to improve the position of their businesses, and plan suitable go-to-market strategies. This report is also expected to help them understand the pulse of the market and provide them with information on key drivers, restraints, challenges, and opportunities influencing the growth of the market.

The report provides insights on the following pointers:

**Market Penetration:** Comprehensive information on directed energy weapon system offered by the top players in the market.

**Product Development/Innovation:** Detailed insights on upcoming technologies, research & development activities, and new product and services launches in the directed energy weapon market.

**Market Development:** Comprehensive information about lucrative markets – the report analyzes the directed energy weapon market across varied regions.

**Market Diversification:** Exhaustive information about new products, untapped geographies, recent developments, and investments in the directed energy weapon market

**Competitive Assessment:** In-depth assessment of market shares, growth strategies, products, and manufacturing capabilities of leading players in the directed energy weapon market

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\*Details on Business Overview, Products Offered, Recent Developments, MnM View, Right to win, Strategic choices made, Weaknesses and competitive threats might not be captured in case of unlisted companies.

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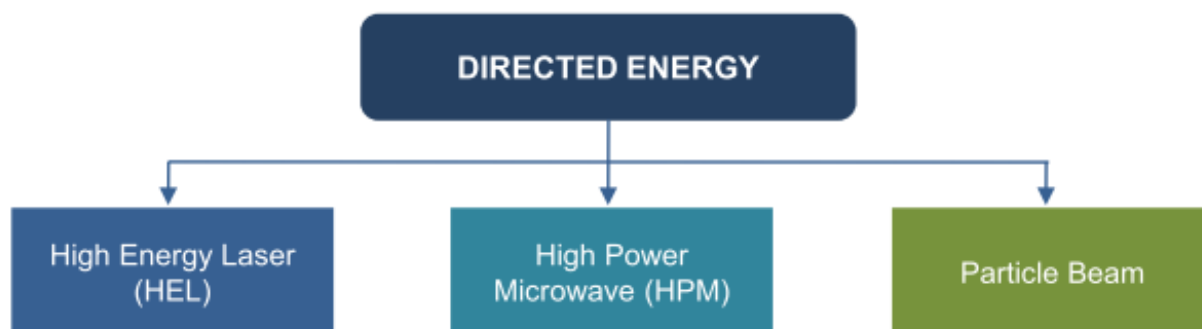
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## About

Directed Energy Weapons (DEWs) transmit energy instead of matter. They have non-zero time of flight compared to conventional ordnance, which allow longer decision times and quicker reaction times. Directed energy weapons are mainly categorized as High Energy Laser (HELs), particle beam, and High Power Microwave (HPM) weapons. Further, HEL weapons are categorized into three technologies, namely chemical lasers, fiber lasers, and Free Electron Lasers (FELs).

The global directed energy weapons market is anticipated to grow at a CAGR of 26.2% by 2020. It is a highly lucrative market and estimated to rise from \$4.55 billion in 2014 to \$18.42 billion by 2020. The market began to grow from 1930s when the Nazis investigated X-ray beams and built an electron accelerator called Rheotron during World War II. Also, in 2003, the U.S. military used high power microwaves in the Iraq War to disrupt and destroy Iraq's electronic systems.

### Directed Energy Weapons Segmentation, By Technology



The table above illustrates the market values for all three technologies of DEWs from the period of 2013 to 2020. The High Energy Laser (HEL) technology is estimated to have the highest CAGR of XX followed by High Power Microwave (HPM), with a CAGR of XX. The U.S. Air Force and Navy are focusing toward HEL weapons rather than HPM, due to the major differences of precision and lethality between them, Particle beam technology is estimated to register growth at a CAGR of XX. Particle beam weapons are spaced-based systems and cannot be penetrated through the atmosphere, so the weapons invented with this technology need to be based in space and are hence rarely used.



Directed energy weapons have two major applications—defense and homeland security. Amongst these applications, defense is the major field where DEWs are more functional. DEWs are being used for defense from the 1930s. Lethal products are used for defense applications whereas, non-lethal are used for homeland security. Recently, products such as laser dazzlers, car stopping microwave systems, Pulsed Energy projectile (PEP) systems, and several others are being used for homeland security. There have been huge investments in DEWs for defense application from several years. It is anticipated that the DEW market will be dominated by products in defense application in the coming years.

North America accounts for XX of the total DEW market in 2013. It is estimated that Middle East will register the highest CAGR of XX from 2014 to 2020, followed by Latin America and Asia-Pacific. It is anticipated that Middle East and APAC are showing maximum inclination towards the defense sector and ultimately will have highest procurements in DEW till 2020. Due to the declining economic conditions in North America, it has decreased its defense budget of 2014 with a possibility of further reduction in the future, which will ultimately impact its market till 2020.

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