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Drones & Human Rights: Emerging Issues for Investors

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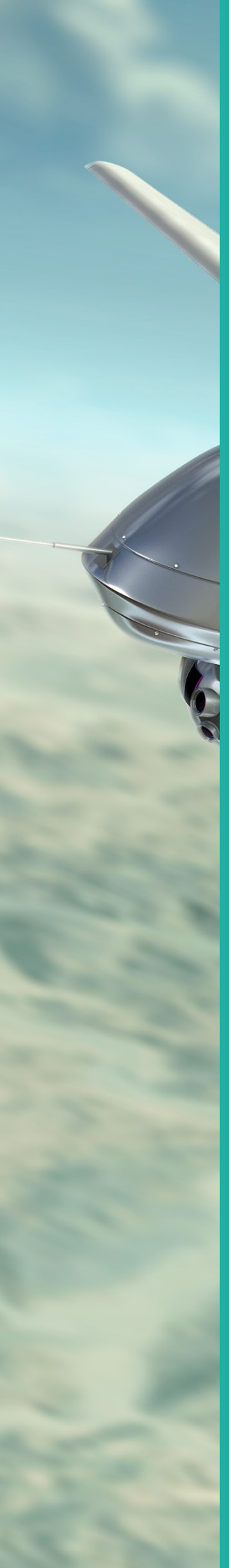

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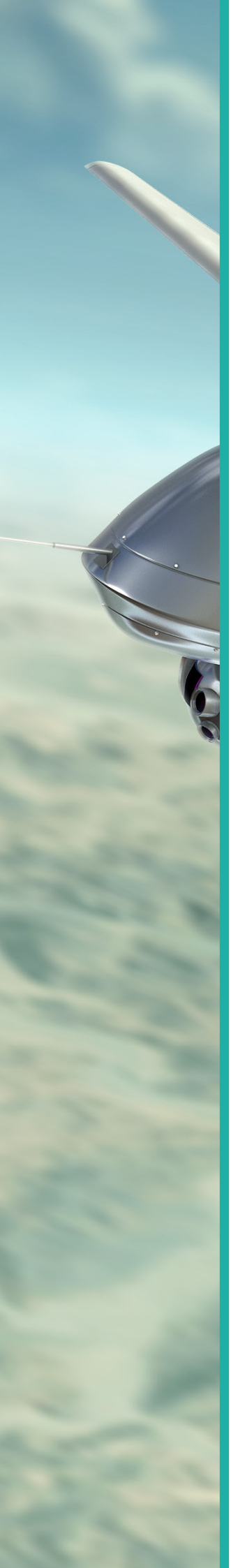


Table of Contents

Drones and Human Rights: Emerging Issues for Investors

The market for unmanned aerial vehicles, or drones, is lucrative, competitive, and growing. However, the use of drones has been subjected to significant public scrutiny and has been debated in various international and national bodies and courts. 2012 and 2013 saw a flurry of drone-related court cases and widespread attention from the media, academics and NGOs. Several civil society reports have addressed the issue, releasing highly critical statements and challenging the legality of drone use.[1] UN Special Rapporteurs Ben Emmerson (counter-terrorism and human rights) and Christof Heyns (extrajudicial, summary or arbitrary executions) have also addressed the issue in various reports[2] presented to the UN General Assembly and UN Human Rights Council throughout 2013 and 2014.

This piece explores current developments and issues surrounding drones and provides insight into human rights risks related to their development and use, both for companies and investors. The report addresses three specific areas relating to drone technologies and their use that investors should be aware of: the development of "autonomous" lethal drones, the use of drones for targeted killings outside recognised war zones, and privacy in light of the data collection capabilities of drones. The last section of this report focuses on ways in which investors can manage risks relating to investment in drone manufacturers.

What are Drones?

Generally speaking, the term "drone" can refer to any remote-controlled vehicle, encompassing submersible, land-based, and aerial vehicles. The latter, known as unmanned aerial vehicles (UAVs), is the focus of much controversy because of their versatility and freedom of movement.[3] When armed, these aerial drones are known as unmanned combat air vehicles (UCAVs).

UAVs come in various shapes and sizes, ranging from spy drones as small as insects, to hand-launched commercial drones, to military aircraft with 20-metre wingspans that are capable of carrying missiles. The current generation of military drones are piloted from ground control stations, where pilots navigate planes via a direct-satellite connection.

In many ways, the proliferation of military drones can be seen as a logical technological development, as they unite the important roles of surveillance, reconnaissance, and assault. Without pilots weighing down the aircrafts, current classes of military drones now have

flight capabilities of up to 48 hours and can carry armaments allowing them to attack identified targets. Proponents of the military use of drones claim that drone strikes are more precise than other forms of assault, thereby reducing collateral damage. Drones have also been hailed as cost-effective, as they are far cheaper than other military aircraft that require on-board life-support systems to sustain pilots.

Current technology already allows much of the navigation, tracking, and identification by drones to be automated. This reduces the likelihood of human error, but also fuels the idea of an "autonomous" machine that is fully governed by its own artificial intelligence. However, the reality is that, instead of taking the human out of the decision-making process, the technology in currently deployed drones is limited to streamlining and automating certain standard functions and operations. For example, for some of the more sophisticated drones, a person needs only to input a destination and the drone will navigate there itself, controlling its altitude and speed and making any necessary adjustments.[4] In certain situations, such as landing, the drone can alter or abort its flight pattern, but then revert to a pre-programmed pattern.

The following timeline shows the development of drones since their inception in the late 1930s.

Radioplane Company (acq. by Northop Grumman)

Radioplane OQ-2
Radio remote-controlled target practice.

Ryan Firebee
Reconnaissance capabilities.

AAI Corp / Israel Aerospace Industries

AAI's Scout / Pioneer
Live video feed; lightweight; 5-hour endurance; turboprop engine.

Leading Systems Incorporated (acq. by General Atomics)

GNAT-750
GPS nav.; self-flying/cruising functions; 48-hour endurance; low-light cameras.

General Atomics

MQ-1 Predator
SAT link – piloted from another continent; laser targeting.

Northrop Grumman

RQ-4 Global Hawk
Synthetic aperture radar; landing/ take-off/ navigation autonomy; turbofan engine.

General Atomics

MQ-9 Reaper
115 hp piston engine; increased weapons capacity; hunter-killer role.

General Atomics

Avenger
Stealth features; internal weapons bay; turbofan engine; increased fuel capacity.

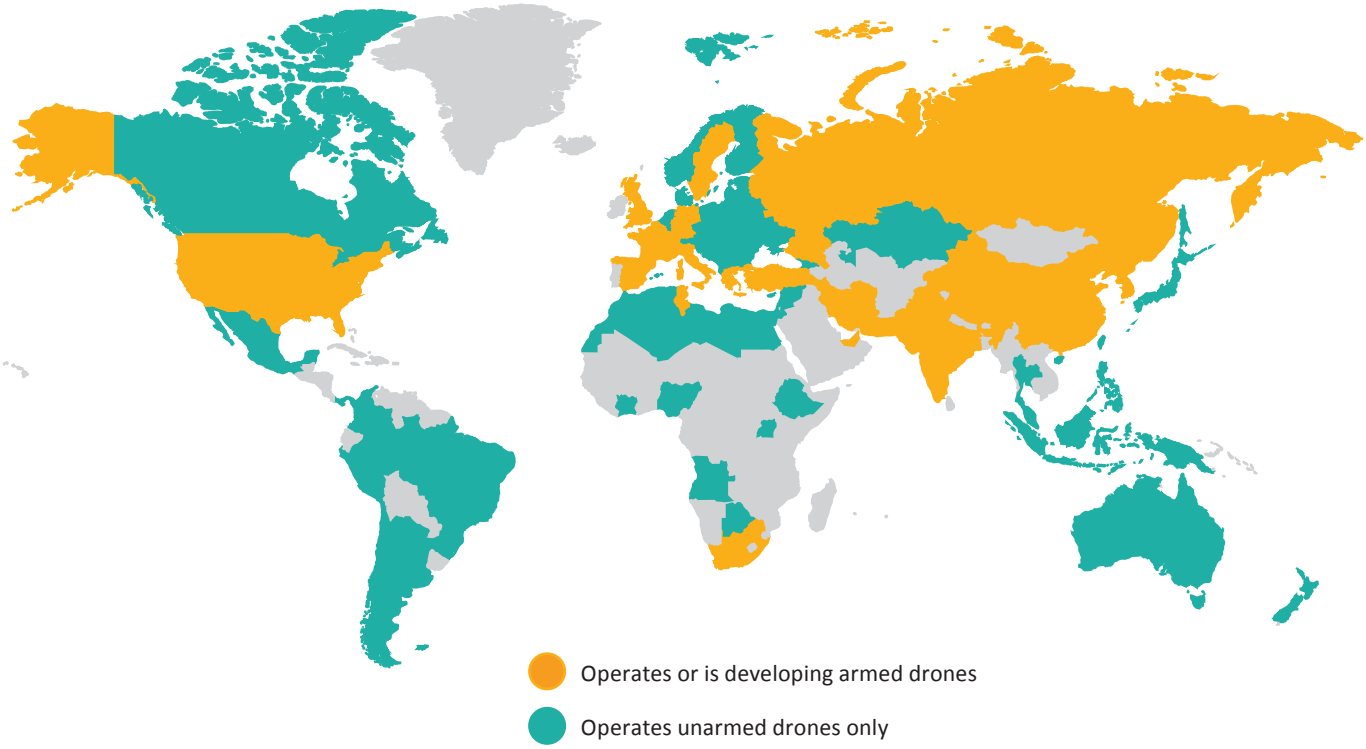
Northrop Grumman

X-47B
Improved autonomous navigation, take-off, and landing; Mach 0.9 speeds; tailless; carrier landing.

Despite the controversy surrounding drones and their use, their advantages are making them a mainstay in both the military and commercial sectors. The significant growth in the use of UAVs in recent years has created a market that, by the end of 2012, was valued at an estimated USD 7.5 billion. Some executives in Israel's defence establishment reportedly estimate that this market may be worth USD 50 billion by 2020.[5]

Military Drone Users and Producers

Today, as many as 87 countries use some form of military UAV.[6] Despite the lack of transparency on the part of many countries, notably China, Iran, and Russia, regarding their use of drones, it is the United States that dominates the market and holds the majority of the global supply of military drones.[7] The figure below highlights those countries using or developing UAVs or UCAVs.[8]



As of early 2014, there were an estimated 490 UAV manufacturers based in about 60 countries.[9] Israel was one of the first countries to develop unmanned systems (circa late 1970s) and is now the world's largest exporter and second largest manufacturer of UAVs, selling to countries in Latin America, Asia, and Africa. Israel has two major UAV producers that cater to the defence industry: **Elbit Systems Ltd.** and **Israel Aerospace Industries, Ltd.** (IAI). Elbit produces the armed Hermes drone series, which can fly for more than 20 hours, has a range of optical, infrared and laser sensors, and can carry two hellfire missiles. IAI produces the Eitan drone, which is capable of staying aloft for 48 hours and can be used for strategic missile defence.

The U.S. is by far the largest producer of UAVs, with roughly a dozen top UAV manufacturers and many smaller producers that together produce numerous styles of drones serving different markets and purposes. However, as the commercial drone market has only recently begun to expand, the U.S. Department of Defense (DoD) remains the largest buyer, spending USD 3.1 billion on drones in 2012.[10] The agencies most using drone technology are the CIA and the DoD. The two main American military drone contractors are **General Atomics** and **Northrop Grumman,** which in 2013 accounted for 20% and 19% of the global UAV market, respectively. Other U.S.-based producers include **Lockheed Martin, AAI Corporation, SAIC, Textron,** and **Boeing**. To date, only General Atomics' three drone models have been used offensively: the MQ-1 Predator, MQ-9 Reaper, and the MQ-1C Grey Eagle. Northrop Grumman's X-47B UCAV was developed as part of the U.S. Navy's Unmanned Carrier-Launched Surveillance and Strike (UCLASS) programme, and is expected to enter service in 2019.

According the International Business Times, the top 12 UAV producers for 2014/15 will be:

1.	Boeing (USA)
2.	General Atomics (USA)
3.	Lockheed Martin (USA)
4.	Northrop Grumman (USA)
5.	Aerovironment, Inc. (USA)
6.	Prox Dynamics (Norway)
7.	Denel Dynamics (South Africa)
8.	SAIC/Leidos Holdings Inc. (USA)
9.	Israel Aerospace Industries (Israel)
10.	Textron (USA)
11.	General Dynamics (USA)
12.	DJI Innovations* (China)

** non-defence company*

In Europe, demand for domestic drone programmes is growing, and in late 2013 **BAE Systems** (United Kingdom) revealed its semi-autonomous UCAV, Taranis, which will carry a variety of armaments, will employ stealth technology, and is designed to fly intercontinental missions.

The cost of drone production in China is significantly lower than in other countries. Major manufacturers in the country include **China Aerospace Science & Industry Corp.** (CASIC), **China Aerospace Science and Technology Corporation** (CASC), and the **Aviation Industry**

Corporation of China (AVIC). Among the combat drones produced by these companies are CASC's CH-4, a reconnaissance and combat drone with a range of 3,500 kilometres and the capacity to carry four precision-guided bombs, and AVIC's very similar "Wing Loong." Both models reportedly have a mission role similar to that of American combat drones (e.g., MQ-9), but with a much cheaper price tag of just under USD 1 million.

Other players are likely to enter the market, with potentially far-reaching geopolitical implications. India has been working with Israel to develop its own drones and Pakistan is reportedly doing the same with assistance from China. In the Middle East, Iran's Air Defense Unit builds combat and surveillance drones, with the latest model, Fotros, designed to stay aloft for 30 hours and engage ground targets.[11]

The following table presents some of the key components of drones and the companies involved.

	MQ-9 Reaper	MQ-1 Predator	X-47B
	The MQ-9 Reaper is an unmanned, armed, multi-mission, medium-altitude, long-endurance aircraft.	The MQ-1 Predator is an unmanned, armed, multi-mission, medium-altitude, long-endurance aircraft.	The X-47B is an unmanned combat air vehicle. It was developed as part of the US UCLASS programme to produce an armed, autonomous system.
Main contractor	General Atomics Aeronautical Systems, Inc.	General Atomics Aeronautical Systems, Inc.	Northrop Grumman (NYSE:NOC)
Engines	Honeywell International Inc. (NYSE:HON)	BRP-Powertrain GmbH & Co KG	UTC (NYSE:UTX)
Armament	Lockheed Martin (NYSE:LMT), Raytheon (NYSE: RTN), Boeing (NYSE: BA)	Lockheed Martin (NYSE:LMT), Raytheon (NYSE: RTN)	The X-47B is not yet armed
Sensors and communication	L3-Communications (NYSE:LLL), Raytheon (NYSE: RTN)	L3-Communications (NYSE:LLL), Raytheon (NYSE: RTN)	Honeywell International Inc. (NYSE:HON)

Controversies over the Uses and Characteristics of Drones

For investors we identify a number of risks related to developments in drone technology and the current uses of drones. These risks relate to:

- the growing possibilities for autonomous action in identifying, following, and eliminating human targets;
- the lethal use of drones by states outside of recognised war zones; and
- concerns surrounding the civilian use of drones and possible threats to the right to privacy.

Killer Robots: The Development of Lethal Autonomous Drones

In the current deployment of unmanned systems, there is still a person "in the loop", meaning that human judgment remains necessary to identify and eliminate targets. In other words, attacks are ordered by a person, who can theoretically be held accountable. However, countries are continuing to develop drones that are increasingly autonomous, which could one day result in a situation where human intervention is no longer needed. These fully autonomous combat drones, also known as lethal autonomous robots (LARs), would be designed to respond to programmed inputs and to select and eliminate targets without human review.

This technology is rapidly advancing and various examples of fully or semi-autonomous weapons already exist. One is the sentry system, which was manufactured by **Samsung Techwin** to guard the demilitarised zone between North and South Korea. Using heat and motion sensors, the system is able to detect and attack anyone crossing the zone, with minimal human review.[12] Furthermore, based on Northrop Grumann's X-47B, the U.S. Navy is continuing to develop its autonomous drone fleet, which is expected to have striking capabilities and to be operational in 2019.[13] The rationale behind this development is the assumption that lethal autonomous drones will be able to outperform human operators, and that their use will enhance the safety and quality of life of troops on the side of the user.

The development of lethal autonomous drones raises ethical questions. "Killer robots," as some have called them, lack human judgment, which may serve to restrain the lethal use of force under some circumstances. UN Special Rapporteur Christof Heyns warned that "there is widespread concern that allowing LARs to kill people may denigrate the value of life itself. Tireless war machines, ready for deployment at the push of a button, pose the danger of permanent… armed conflict."[14]

Academics, NGOs, and international organisations, such as the International Committee for Robot Arms Control (ICRAC), have been vocal in their calls for regulation and even bans on this technology; calls that have intensified in recent years.[15] Human Rights Watch, in a recent report on the issue, recommended that states adopt national laws and policies to prohibit the development, production, and use of fully autonomous weapons.[16] ICRAC and more than 50 organisations in 24 countries, including Human Rights Watch, Article 36, and others, have formed a coalition called The Campaign Against Killer Robots, which calls for a similar peremptory ban on the development of autonomous weapons.[17] In May 2013, Christof Heyns joined the ranks of parties calling for a moratorium on the "testing, production, assembly, transfer, acquisition, deployment and use" of LARs until an international conference can develop rules for their use.[18]

In May 2014, the first attempt to do so took place in an informal meeting, under the auspices of the UN Convention on Certain Conventional Weapons (CCW). During the week-long conference, diplomats from 87 countries, as well as experts from civil society, discussed the issue of fully autonomous weapons systems. The meeting provided a platform where experts attempted to define autonomy, discuss the necessary degree of human control, and the human rights implications. While numerous countries, including Germany, France, and the Netherlands, agreed that meaningful human oversight is needed, only five countries called for a pre-emptive ban on fully autonomous weapons, namely: Cuba, Ecuador, Egypt, the Vatican, and Pakistan. Nevertheless, the summit was concluded with a resolution to address the issue again in November 2014.[19]

Targeted Killings in Non-Conflict Territories

While the majority of drone strikes have been conducted within the context of conventional armed conflict, the U.S. has publicly asserted the right to conduct lethal counter-terrorism operations outside of conflict zones. Much of the current critique surrounding UCAVs relates to their use in covert operations outside recognised war zones, with considerable costs for local populations in regions where they are carried out.

The bulk of this criticism has focused on the U.S. use of drones in countries with which it is not formally at war, including Pakistan, Somalia, and Yemen. Using Predator and Reaper drones, the U.S. conducts so-called targeted killings mainly through the use of two types of strikes: "personality" strikes, which target specific persons with known identities, and "signature" strikes, which target groups of individuals with certain signatures or defining characteristics. The first post-2001 targeted killing by the U.S. government outside Afghanistan allegedly occurred in Yemen in November 2002, when a CIA-operated Predator drone fired a missile at a suspected terrorist travelling in a car with five other passengers, one of whom was an American. UN Special Rapporteur on extrajudicial, summary or arbitrary executions, Philip Alston, condemned the strike as a "clear case of extrajudicial killing."[20] In February 2013, Senator Lindsey Graham suggested that the U.S. had killed 4,700 people through drone strikes.[21] The Bureau of Investigative Journalism (TBIJ) reported that, as of March 2014, between 2,637 and 4,729 people had been killed by drone strikes in Pakistan, Somalia, and Yemen.[22]

Human rights organisations contend that these killings violate international human rights law. Criticism surrounds the strikes themselves as well as the vague and non-transparent manner in which drones are used by governments. UN Special Rapporteur on counter-terrorism and human rights, Ben Emmerson, has argued that the lack of transparency has created an accountability gap, adversely affecting the ability of victims of human rights violations to seek redress.[23] The reported U.S. practice of designating all military-aged men in a strike zone as combatants[24, 25] has also been heavily criticised, as has the absence of a legal basis for determining the scope of drone strikes or who can be targeted. Moreover, it has been argued that, apart from those targeted directly, communities living in strike zones are severely affected. Dr. Peter Schaapveld, a clinical and forensic psychologist who travelled to Yemen in 2013 to assess the psychological impact of drone strikes on communities, found a high rate of post-traumatic stress disorder among both adults and children.[26] Similar findings were noted in Pakistan by research teams from Stanford Law School and New York University in the 2012 report "Living Under Drones."[27]

Campaigns against the lethal use of force outside war zones have been vocal and highlight human rights concerns. In a series of court cases filed in the U.S., the U.K., and Pakistan, plaintiffs and NGOs alleged that these strikes violated the human rights to life, freedom from torture or cruel, inhuman or degrading treatment, privacy and family life, the freedom of assembly, and freedom of association. A citizens' indictment by Upstate Drone Action charged President Obama with war crimes and crimes against humanity.

Public scrutiny by courts and international organisations has also increased. On May 9, 2013, the Peshawar High Court[28] issued the first substantive judgment on the legality of U.S. drone strikes in Pakistan, which, it ruled, constituted a blatant violation of basic human rights, a violation of the Geneva Conventions, and a breach of national sovereignty. In a debate during the 23rd session of the UN Human Rights Council the same month, many Member States described targeted killings by drones as extrajudicial, summary, and arbitrary executions and as flagrant violations of the right to life.

In February 2014, the European Parliament adopted a resolution urging the Council of Europe to adopt a common EU position on the use of armed drones. In the Resolution, the European Parliament concluded that "drone strikes outside a declared war by a State on the territory of another State without the consent of the latter or of the UN Security Council constitute a violation of international law and of the territorial integrity and sovereignty of that country" and expressed its "grave concern over the use of armed drones outside the international legal framework."

Following a request by Pakistan and two permanent members of the UN Security Council, the UN Human Rights Council launched an official inquiry into the use of drones in counter-terrorism operations in January 2013. The report, completed by Special Rapporteur Ben Emmerson in March 2014, noted that in 2013 drone strikes accounted for 40% of all civilian casualties from air strikes and that states responsible for drone strikes have a duty to conduct inquiries into all drone strikes where civilians have been, or appear to have been, killed. The same month, the UN Human Rights Council adopted a resolution to study whether American drone strikes were in compliance with international law.[29]

Drones and the Right to Privacy

Finally, the civilian use and commercial sale of drones has also raised human rights-related questions. As academics and members of civil society are increasingly pointing out, drones, which are built for surveillance and extensive data gathering, represent a novel threat to privacy. This has led to significant backlash from civil society organisations, which are actively engaging with governments to put the privacy issue on the political agenda, both in Europe and the U.S.[30] Issues currently debated include the impacts of UAVs on citizens' right to privacy and the implications for data protection, particularly where drones are used to capture personal data. The public nature of air space gives rise to novel concerns relating, for example, to the use of drones by paparazzi, stalkers, or thieves, who, under current legal regimes, may not be banned from using drones to track individuals and monitor private homes.

Unease about privacy rights has led to a surge in requests for legal clarity. In February 2012, the American Civil Liberties Union (ACLU), the Electronic Privacy Information Center (EPIC) and 32 other NGOs petitioned the U.S. Federal Aviation Administration (FAA) to formulate

rules addressing the threat to privacy and civil liberties resulting from the deployment of aerial drones within the U.S. In April 2013, Virginia became the first state to enact drone laws prohibiting drone use by state law enforcement and regulatory agencies until 2015. Idaho soon followed, adopting a law requiring warrants for the use of drones by law enforcement and establishing guidelines for their use by private citizens. By June 2013, bills concerning UAVs had been enacted in eight states, and resolutions were adopted in another ten.[31] By March 2014, 35 states were reportedly considering drone legislation in light of growing concern over privacy rights and government intrusion.

In the European Union, the civilian use of drones is currently permitted in a number of member states, though legal restrictions differ in each country. In June 2013, the European Commission published a roadmap that will permit drones to fly in civilian airspace by 2028. The European Commission has also announced its intention to harmonise legislation with respect to civilian drone use to ensure the same level of safety and security across the EU and to establish common rules for public and intra-EU flights.[32] Theoretically, EU and Member State laws require drone controllers to provide individuals with information about the way in which the data they collect is processed, although exemptions may apply where informing them would involve disproportionate efforts. It is currently unknown whether drone controllers benefit from this exemption, or what regulations might be imposed on drone users or producers.[33]

Managing Risks

The human rights risks outlined above can pose reputational, regulatory, and other risks for companies and may have material consequences for companies and investors alike. The following sections present an overview of these risks and the ways in which they can be addressed and managed by investors.

Legal and Regulatory Risks

To date, court cases that have addressed drone use have only targeted governments, both as the users of drones (as in the cases of the U.S. and the U.K.) and for failing to protect citizens from drones on their territory (as in the case of Pakistan). Companies that produce drones have not yet been affected, and, in the short term, it is unlikely that they will be exposed to legal action as a result of alleged human rights violations by the end users of drones. With an increasing number of legal venues that adjudicate business and human rights-related cases, however, the possibility that companies may eventually become the targets of human rights court cases relating to drone use cannot be ruled out.

As noted earlier, the proliferation of drones has led to calls for adequate legal control and accountability. Regulatory regimes, many still under development, are only just beginning to address the issues associated with drones. The commercial sale of drones may be affected by regulatory developments in the relatively short term, for instance where new regulations prohibit the use of drones in domestic air space, as several U.S. states have already done.[34] Calls for bans on fully autonomous weapons may eventually give rise to legislation on this issue, at both national and international levels. Given the significant expenses involved in the development of fully autonomous systems, such bans have the potential to affect returns on research and development in the medium and long term.

The extent to which future legislation may impact companies will vary. Some participants in drone-producing consortia derive only a very minor portion of their revenues from drone sales, including large defence companies like **Northrop Grumman, Boeing,** and **Lockheed Martin**. In contrast, some companies for which drone production is a major focus, such as **AeroVironment**,[35] may be more affected by legislation limiting the use of drones due to privacy concerns.

Reputational Risks

Public criticism of how military drones are used is significant, both within the U.S. and at the international level. A survey conducted by the Pew Research Center's Global Attitudes project found that "[i]n 17 out of 20 countries surveyed, more than half the population disapproved of U.S. drone attacks targeting extremist leaders and groups in nations such as Pakistan, Yemen and Somalia." In the U.S., protests have been held at the White House and Hancock Field to object to the government's use of unmanned drones, both domestically and outside the U.S., demanding that drone strikes cease. Similar protests against armed drones being operated from Britain for missions in Afghanistan have also been held at the Royal Air Force (RAF) base in Waddington, U.K.

The use of drones in ways that violate human rights, such as for targeted killings outside recognised warzones, exposes companies to public criticism and allegations of complicity in human rights violations, with corresponding reputational risks. Investors in companies involved in drone production may, in turn, be exposed to these risks through their

investments. Increasingly, investors are being held accountable for the human rights impacts of their investments.[36, 37] In November 2012, U.K.-based NGO Reprieve called on several large insurers and pension funds, including PensionDanmark, the Norwegian Government Pension Fund, and insurers Legal & General, Old Mutual and Axa, to divest from firms producing combat drones.[38]

Risks may also arise from the vulnerability of drones to hacking. In 2009, U.S. defense officials told reporters that Iranian-backed militias used software to intercept video feeds of drones flying over Iraq, and, in 2011, a virus was reported to have infected drone control systems at Creech Air Force base in Nevada.[39] These incidents raise concerns not only about the safety, security and reliability of unmanned aircraft, but also the privacy and the security of data stored by drones.

Addressing Risks

Although the primary responsibility to protect human rights rests with states, frameworks such as the UN Global Compact and UN Guiding Principles on Business and Human Rights (the Ruggie Framework) also emphasise the responsibility that businesses have to respect human rights. This responsibility includes the duty to comply with international human rights norms as well as to avoid complicity in violating the human rights of others.

This responsibility is not limited to corporations but extends to investors,[40] some of whom have faced increasing exposure to allegations of involvement in human rights violations linked to their investments. In 2013, both the Dutch and the Danish National Contact Points for the OECD Guidelines pointed out the responsibility of investors to conduct human rights due diligence with respect to their investments, even where they are minority shareholders.[41, 42]

The human rights issues surrounding drone use are largely the result of actions by states and third parties, giving rise to the possibility of corporate complicity in human rights violations. While many investors have policies excluding producers of cluster munitions and anti-personnel mines, both of which are banned by UN treaties, few have taken steps to assess the human rights implications of investments in drone producers. To limit their exposure to human rights and reputational risks, investors are encouraged to:

- Remain aware of risks and keep abreast of legal and regulatory developments;
- Formulate a stance on drones, defining high-risk uses and high-risk end users;
- Engage with companies to address the regulatory and human rights-related risks to which the companies are exposed.

As part of human rights due diligence, investors are also recommended to identify a number of points that will enable them to ascertain the extent to which drone producers may be linked to human rights violations. This includes efforts to identify the countries to which a company has sold drones, where they are being used, what steps a company is taking to assess the possible adverse human rights impacts of drone sales, and what policies they have in place to define responsible behaviour with respect to drone use in accordance with international law.

Annex - Addressing Risks Through Engagement

Engagement with companies should address the steps they are taking to monitor, mitigate, and address the human rights-related risks to which they are exposed through drone production. Because transparency is often lacking in drone programmes, an important area of engagement concerns the steps, if any, that companies are taking to "know their customers."

Questions that investors can ask drone producers include:

- Does the company have **restrictions on the sale** of drones and drone technology to states that may abuse them?
- Does the company request information from its clients on **how drones are used**? If so, how does the company determine whether or not these uses are in line with international humanitarian and/or human rights law?
- Is the company taking steps to **liaise with regulators**, such as data protection authorities, to anticipate or avoid restrictions with respect to UAV activities?
- What steps is the company taking to **monitor and track** the security of its drone technology, including its vulnerability to hacking?
- Does the company **liaise with drone users, such as the CIA**, about the ways in which **data collected by drones is processed and used** (this may cover such issues as the right to privacy, transparency about processing entities, the duration for which data is stored, the rights of subjects to access or rectify data captured, etc.)?
- How does the company **monitor compliance** with international humanitarian and human rights law in the end use of its products?
- Does the company **provide conditions** that ensure that services, such as maintenance, are not provided for drones that are used in violation of international human rights and humanitarian law?
- Is the company involved in the **development of fully autonomous lethal drones**? If so, what steps is it taking to address regulatory risks associated with such drones?

Endnotes

[1] Examples of such reports include: Drone Wars UK: "Drone Wars Briefing: Examining the Growing Threat of Unmanned Warfare", January 2012; Amnesty International: "United States of America 'Targeted Killing' Policies Violate the Right to Life", June 2012; Stanford Law School and NYU School of Law: "Living Under Drones: Death, Injury and Trauma to Civilians from US Drone Practices in Pakistan", September 2012; Human Rights Watch: "Losing Humanity: the Case Against Killer Robots", November 2012; International Crisis Group: "Drones: Myths and Reality in Pakistan", 21 May 2013, Asia Report No. 247.

[2] Heyns, Christof: "Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions (A/HRC/23/47)", April 9, 2013; Heyns, Christof: "Report of the Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions (A/68/382)", September 13, 2013; Emmerson, Ben: "Report of the Special Rapporteur on the promotion and protection of human rights and fundamental freedoms while countering terrorism (A/68/389)", September 18, 2013; Emmerson, Ben: "Report of the Special Rapporteur on the promotion and protection of human rights and fundamental freedoms while countering terrorism (A/HRC/25/59)", March 10, 2014.

[3] The term drone and UAV will be used interchangeably, both defined as unmanned aerial vehicles.

[4] Clay Dillow, "What the X-47B reveals about the future of autonomous flight," Popular Science, May 7, 2013.

[5] Arieh O'Sullivan, "Israel grapples with blowback from booming drone industry: One of the world's largest producers of drones now a target of copycat technology," Global Post, October 16, 2012.

[6] Guy Taylor, "U.S. Intelligence Warily Watches for Threats to U.S. now that 87 Nations Possess Drones," The Washington Times, November 10, 2013.

[7] "Military UAV Manufacturers," UAV Global, 2014.

[8] Patrick Tucker, "In 10 years, every country will have a drone army", Defense One, May 8, 2014.

[9] UAV Global, "List of Manufacturers," 2014.

[10] Rebecca Boyle, "One Third of the Military's Aircraft are now Drones," Popular Science, October 2012.

[11] Brendan McGarry, "Iran Unveils Its Biggest Drone Yet," DefenseTech, last modified November, 18 2013, http://defensetech.org/2013/11/18/iran-unveils-its-biggest-drone-yet/.

[12] "S. Korea Deploys Sentry Robot Along N. Korea Border," Defense News, July 13, 2010.

[13] Jon Hemmerdinger, "US Navy releases draft of UCLASS RFP," Flight Global, April 17, 2014.

[14] UN General Assembly, Human Rights Council, 33rd session, "Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns," April 9, 2013, (A/HRC/23/47).

[15] International Committee for Robot Arms Control (ICRAC), "Berlin Statement," October 2010.

[16] Human Rights Watch, "Losing Humanity: The Case against Killer Robots," November 2012.

[17] Campaign to Stop Killer Robots, accessed April 2014, http://www.stopkillerrobots.org/coalition/.

[18] "Report of the Special Rapporteur on extrajudicial, summary or arbitrary executions, Christof Heyns."

[19] Adrianne Jeffries, "Only five countries actually want to ban killer robots", The Verge, May 16, 2014.

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[31] National Conference of State Legislatures, "2013 State Unmanned Aircraft Systems (UAS) Legislation," June 2013, retrieved from: http://www.ncsl.org/issues-research/justice/unmanned-aerial-vehicles.aspx.

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[34] In April 2013, the National Association of Criminal Defense Lawyers (NACDL) announced the launch of its Domestic Drone Information Center (DDIC), citing growing concern within the U.S. about the domestic use of drones. The DDIC will follow legislative developments on the use and proliferation of drones in the U.S.

[35] AerVironment, Inc. is a California-based technology company involved in energy systems, electric vehicle systems, and unmanned aerial vehicles.

[36] Recent rulings by the National Contact Points for the OECD Guidelines in Norway and the Netherlands have pointed to the responsibilities of investors to conduct due diligence to mitigate/prevent human rights-related risks resulting from their investments, including for minority shareholders.

[37] Norwegian National Contact Point for the OECD Guidelines for Multinational Enterprises, Final Statement, Complaint from Lok Shakti Abhiyan, Korean Transnational Corporations Watch, Fair Green and Global Alliance and Forum for Environment and Development vs. POSCO (South Korea), ABP/APG (Netherlands) and NBIM (Norway), May 27, 2013).

[38] Jan Wagner, "European institutions should dump drone investments, say campaign group: Reprieve contacts major insurers and pension funds," Responsible Investor, November 19, 2012.

[39] Joshua Foust, "Why America Wants Drones that can Kill without Humans," Defense One, October 8, 2013.

[40] This interpretation of the Guiding Principles has been affirmed by the Office of the High Commissioner on Human Rights (OHCHR). See, for example, OHCHR: "Response to SOMO: The issue of the applicability of the Guiding Principles on Business and Human Rights to minority shareholdings", April 26, 2013; and OHCHR: "Request from the Chair of the OECD Working Party on Responsible Business Conduct", November 27, 2013.

[41] National Contact Point OECD Guidelines for Multinational Enterprises (Netherlands): "Final Statement, ABP/APG – Lok Shakti Abhiyan, KTNC Watch, Fair Green and Global Alliance, Forum for Environment and Development", September 18, 2013.

[42] The Norwegian Contact Point for the OECD Guidelines for Multinational Enterprises: "Final Statement: Complaint from Lok Shakti Abhiyan, Korean Transnational Corporations Watch, Fair Green and Global Alliance and Forum for Environment and Development vs. POSCO (South Korea), ABP/APG (Netherlands) and NBIM (Norway)", May 27, 2013.

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