

# Dirty Profits 7



**Out of Control:  
Irresponsible weapons transfers  
and future weapon systems**

# Content

---

**Executive Summary** 4

---

**Controversial Arms Exports –  
The Role of Defence Companies and Banks** 8

---

**Controversial Weapons –  
The Role of Defence Companies and Banks** 10

---

**Methodology** 12

---

**Controversial Exports in the MENA Region:  
Country profiles** 16

---

## **Company Profiles**

Airbus SE 21

BAE Systems 23

Boeing Co 25

General Dynamics Corp 27

Leonardo SpA 28

Lockheed Martin Corp 29

Northrop Grumman Corp 31

Raytheon Co 33

Rheinmetall AG 35

Thales Group 37

ThyssenKrupp AG 38

---

## **Features**

Arms Companies Exporting to Israel:

Complicit in the Support of Collective Punishment and Restriction of Movement of  
Palestinians, and Violations of International Law 40

Hand-in-Hand:

Banks and Arms Companies Profiting From War (Crimes) in Yemen 42

The Bottom line:

Why Autonomous Weapons are a Bad Investment 48

---

## **Harmful Investments**

European Banks – Defence policies compared 51

Asset Managers:

→ Blackrock Inc: Sustainability Champion or Lord of War? 53

→ Investing Money *Safely* – A Deadly Business! 55

---

**Recommendations and Demands** 57

---

## **Appendices to the report**

Appendix 1: Table of Weapons Exports by Company 61

Appendix 2: Financial Data Tables 70

Appendix 3: Financial Institution Divestment from Companies 71

Appendix 4: Heading Towards Autonomy? A Potential Watchlist 73

Appendix 5: Assessment for Middle East and North Africa  
(MENA) Region Countries 75

---

### **Cover Photo:**

Smoke rises during an air strike on an army weapons depot on a  
mountain overlooking Yemen's capital Sanaa April 20, 2015.

REUTERS/Khaled Abdullah

“ Weapons from the USA, the United Kingdom and France are in high demand in the Gulf region, where conflicts and tensions are rife, and Russia, France and Germany dramatically increased their arms sales to Egypt in the past five years.”

Pieter D. Wezeman, Senior Researcher with the SIPRI Arms and Military Expenditure Programme<sup>1</sup>

“ It is shameful that four years after the escalation of the armed conflict in Yemen, the US, UK, France and other European countries continue to sell arms to members of the coalition, especially Saudi Arabia and the UAE. These countries have a choice to make — take the side of Yemeni civilians and prioritize justice and peace or continue fuelling the war with weapons and emboldening war criminals with impunity.”

Radhya Almutawakel, chairperson of Mwatana for Human Rights<sup>2</sup>

“ Imagine the consequences of an autonomous system that could, by itself, target and attack human beings. I call upon States to ban these weapons, which are politically unacceptable and morally repugnant.”

António Guterres, United Nations Secretary General<sup>3</sup>

“ If you think about developing technology for recognising cancer, that is fine. But if you are adapting it to track down a certain type of individual in a certain environment, and cooperating with others to make an autonomous weapon out of it, don't be surprised if we take a look at you.”

Johan H. Andresen, head of the ethics panel of the Norwegian Government Pension Fund Global<sup>4</sup>

# Executive Summary

This study examines which European banks are the largest funders of the top nine global defence companies (and the two largest German defense companies).<sup>\*</sup> It specifically looks at the extent to which these 11 companies are engaged in controversial arms trade<sup>\*\*</sup> in the Middle East and North Africa (MENA) region.<sup>\*\*\*</sup> The study also looks at which of the top ten defense companies are engaged in the production of controversial weapons. This includes – to a lesser extent – the production of key components of nuclear weapons, but focuses on the emergence of new controversial technologies- namely the emergence of so-called Lethal Autonomous Weapon Systems (LAWS).

The study shows that arms are being exported by global defense companies to controversial countries in the MENA region- to countries in armed conflict, unfree countries, and to (highly) repressive regimes. While accurate values of these arms flows are not available, this study looks at the scale of the flows between 2015 and 2018 to countries defined as controversial.

The study also shows that all of the defense companies are developing increasingly autonomous weapon systems (AWS), showing that these weapons are emerging as key technologies of future warfare and are part of a current global high-tech arms race.

**All of the top 9 (and the two German) global defense companies have exported to controversial countries in the MENA region,** the largest (by volume) of these exporters are Raytheon, Boeing and Lockheed Martin. In addition, Airbus, Leonardo and BAE in part through the joint venture MBDA have exported large numbers of arms to controversial countries – most notably to Saudi Arabia and Egypt (both also part of the Saudi-led coalition in Yemen). **The largest volume of exports overall has been to Saudi Arabia and the UAE – countries not only considered controversial for arms exports due to being defined as unfree countries, but also due to their role in the war in Yemen.**

Of the 25 countries in the MENA region, 16 are considered to be controversial for arms exports – 14 of these were in armed conflict, 9 were unfree regimes, and all except one had high or very high levels of corruption.

Where banks invest in companies exporting to controversial countries (i.e. those companies that have supplied arms to countries in armed conflict, repressive regimes, fragile states, and non-state actors; to countries where corruption is rife and; where products and services supplied/sold affect the sustainable development of poor countries) this exposes banks to significant risk of being linked to human rights abuses and violations. It is essential that banks ensure that they investigate the practices of arms producing and exporting defense companies and that their policies prevent financing and investing in companies that could be linked to these types of controversy. In addition, banks must ensure that they restrict finance to companies involved in the production of nuclear weapons and components.

The ten banks<sup>\*\*\*\*</sup> were selected based on the amounts of finance and investment provided to the 11 companies. Those European banks with the largest finance provided were selected.

The banks shown in this report have each provided finance to at least three of the companies shown here, some banks have provided loan, bond and equity issuances to as many as 8 of the arms companies. **The total finance provided to all these companies amounts to roughly €24.2 billion.**

**Lloyds Bank and UniCredit were the largest overall providers of finance to the companies, totalling €4.1 billion each.** The Italian bank, UniCredit, provided loans and bond issuances to Northrop Grumman (which is involved in nuclear weapons) between 2016 and 2018, totalling €2.8 billion euro. Lloyds provided numerous loan and bond issuances to General Dynamics (which has exported to Egypt and Saudi Arabia and is involved in the production of nuclear weapons) totalling €2.4 billion. **Credit Agricole came in third** with financings of €3.4 billion which included €1.2 billion to Lockheed Martin.

Credit Agricole was the largest investor in the companies with investments (shareholdings and bond holdings) of €3.2 billion. Deutsche Bank ranks second in investments with holdings in all of the companies, totalling €2.6 billion. **Total investments in all companies by the banks is €9.9 billion.** Lloyds and UniCredit had the lowest holdings in the arms companies.

<sup>\*</sup> Lockheed Martin, Boeing, Raytheon, BAE Systems, Northrop Grumman, General Dynamics, Airbus, Leonardo, Rheinmetall and ThyssenKrupp.

<sup>\*\*</sup> Controversial arms trade relates to the supply of (important parts of) weapons and weapon systems, military transport systems and other military goods, as referred to by the Common Military List of the EU.

<sup>\*\*\*</sup> According to data provided by SIPRI

<sup>\*\*\*\*</sup> Deutsche Bank, Commerzbank, Lloyds, Barclays, Credit Agricole, BNP Paribas, BBVA, Banco Santander, Credit Suisse, UniCredit.

Table:

**11 selected global arms companies showing controversial weapons production and exports to controversial countries:**

	Approx no. weapon systems ordered (2015–2018)	Exports to Saudi-Alliance and to controversial countries in MENA region	Production/development of controversial weapons (nuclear/autonomous weapons)*
Raytheon	54,860	Yes	Yes (involved in nuclear) and also in autonomous weapon systems
Boeing	26,180	Yes	Yes (nuclear production), investments in autonomous weapon systems
Lockheed Martin	12,000	Yes	Yes (heavily involved in key components) and developing increasingly autonomous weapon systems
BAE	4,890	Yes	Yes (support for nuclear weapon systems) prototype autonomous weapon systems
General Dynamics	2,900	Yes	Yes (nuclear components) and limited development of autonomous weapon systems
Rheinmetall	1,300	Yes	No nuclear weapons and some autonomous weapon systems
Thales	630	Yes	Yes (nuclear weapon production) and also autonomous weapon systems
Northrop Grumman	190	Yes	Yes (nuclear missile upgrades) and autonomous weapon systems
Leonardo	120	Yes	Yes (key producer of nuclear arsenal) limited development of autonomous weapon systems
Airbus	90	Yes	Yes (production and maintenance nuclear) and autonomous weapon systems
ThyssenKrupp	4	Yes	No nuclear development and no known highly developed autonomous weapon systems.

\* In fully autonomous systems (also known as Lethal Autonomous Weapon Systems or LAWS), the system itself will – without human intervention – be able to choose when, against whom, and how it will use force. None of the companies are as yet producing such LAWS, however the production of increasing autonomous weapons or weapons with autonomous features are being produced (for more on this see page X).

\*\* The company MBDA which is a joint venture between Leonardo, Airbus and BAE system exported approx 2,700 weapon systems to controversial countries.

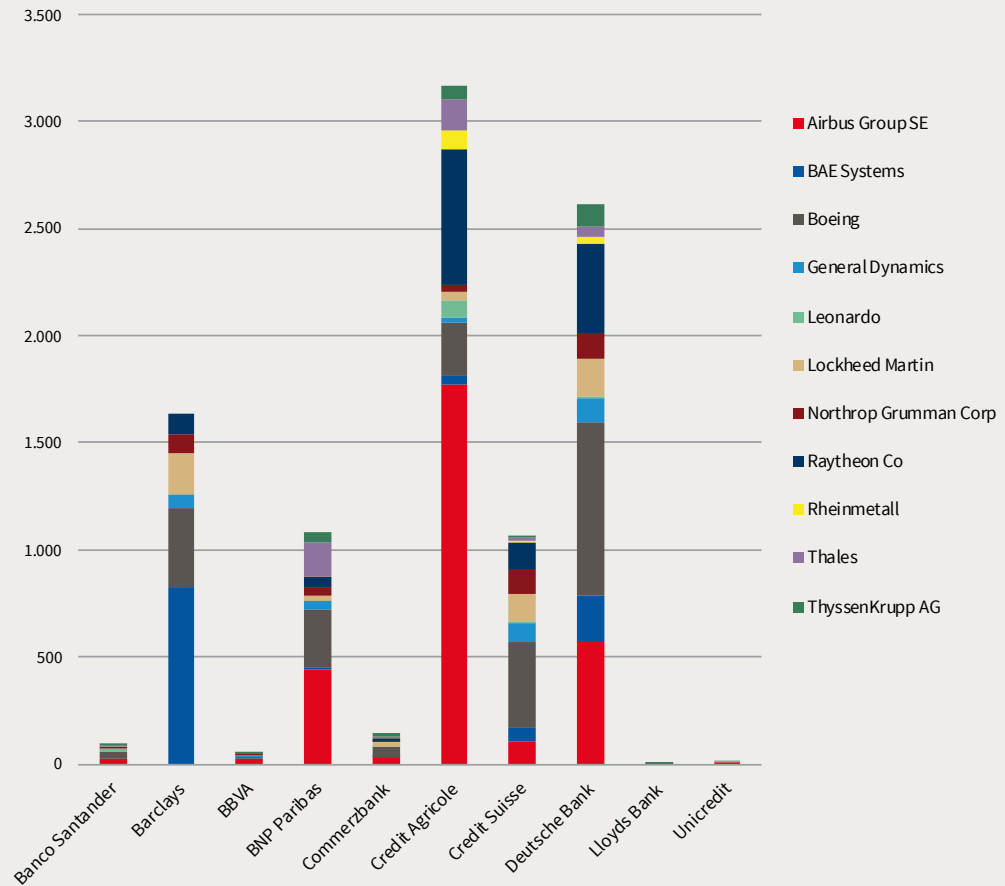
\*\* The joint project Eurofighter exported 72 weapon systems in the period 2015–2018.

The companies with the highest volume of exports to controversial countries are Raytheon, Lockheed Martin, BAE and Leonardo. Lockheed Martin received financing from Barclays, BNP, Lloyds and Credit Agricole as recently as 2018. Lockheed has exported to 7 of the 16 controversial countries in the MENA region and to almost all the countries involved in the Saudi-led Alliance, with the exception of Morocco and Sudan. Lockheed continues to sign new export deals with countries in the Saudi Alliance.

Raytheon received financing in equal parts from BBVA, Deutsche Bank, BNP, Credit Agricole and Credit Suisse in November 2015. Over the time period, Raytheon has exported to countries that are fragile states, those experiencing high levels of instability, poverty and conflict. It has exported to countries where there is oppression of political and civil liberties and countries in the midst of armed conflict. Raytheon too continues to sign new export deals with countries in the Saudi-led coalition and countries considered controversial for exports, e.g. the UAE.<sup>5</sup> Credit Agricole and Deutsche Bank (predominantly through Deutsche Asset Management but also Deutsche Bank AG) have holdings in Raytheon totalling approx. €1 billion.

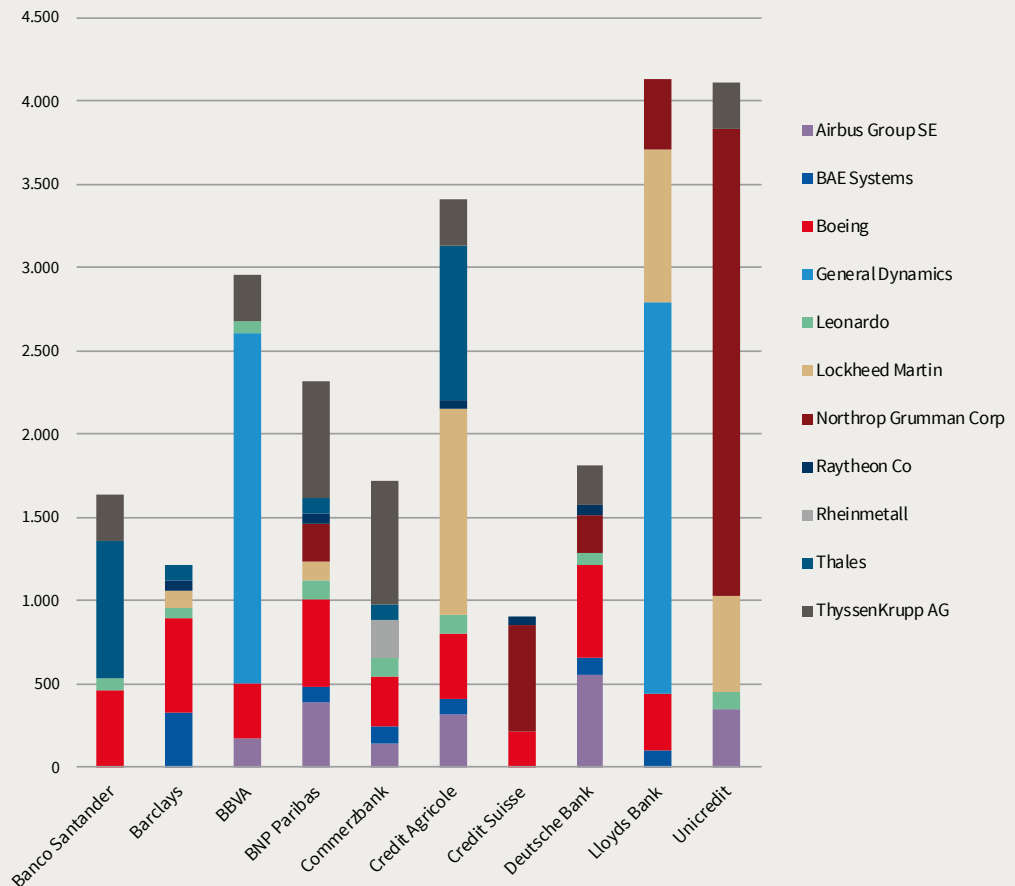
### Shareholdings and bondholdings by bank

(in € millions)



### Loan, bond and Equity issuances by bank

(in € millions)



23 banks participated in a loan to BAE Systems including Barclays, in April 2018 to **€2.3 billion euro**. We estimate Barclays share at 100 million, the same for BNP, Crédit Agricole and Deutsche Bank. At this stage again the Human Rights violations in Yemen were well known. BAE has exported large amounts of weapons to Saudi Arabia and to the UAE and other Saudi-led coalition members such as Jordan. In addition, BAE have exported to Iraq and Lebanon, countries marked as controversial due to armed conflict and state repression. BAE has exported missiles to coalition member countries since 2015 and up until as recently as 2018.

Overall, the responsible investment policies and practices of the banks and asset managers are not sufficient to prevent investments in companies engaging in trade with controversial countries, and those producing controversial weapons. In particular banks need to extend their policies on controversial weapons wider to consider corporate credits, own investments and third-party assets. Bank policies on exports to controversial countries, in particular countries in conflict and fragile states, must be strengthened. All of the banks in this report must improve the scope of their existing policies as well as enhance their definition of controversial countries for arms exports. And finally, global index providers should automatically exclude companies involved in the production of “controversial weapons” as these are the basis for many investment products, both active and passive.

	<b>Total finance provided</b>	<b>Total investments</b>
	(in € mill)	(in € mill)
Banco Santander	1,635.43	97.65
Barclays	1,216.09	1,634.85
BBVA	2,953.58	53.42
BNP Paribas	2,320.26	1,081.84
Commerzbank	1,717.01	142.81
Credit Agricole	3,408.58	3,165.22
Credit Suisse	906.61	1,066.71
Deutsche Bank	1,814.41	2,615.29
Lloyds Bank	4,129.99	4.29
UniCredit	4,109.97	9.97

# Controversial Arms Exports – the role of Defense Companies and Banks

**The wider Middle East and North Africa (MENA) region: Exports by arms companies to unfree, authoritarian regimes; to conflict zones; to fragile states; and to countries with exceedingly high levels of government corruption in defense procurement.**

The global arms trade is increasing steadily with a 10% increase over the period 2013–2017 compared with 2008–2012 and the flow of arms to the Middle East continues to increase. Arms traded by the top 100 companies in 2017, totalled \$398.2 billion. The largest exporting countries were the United States, Russia, France, Germany, and China.<sup>6</sup> Since 2000, an estimated 60% of the world’s conflict-related deaths have been in the MENA region, while violence in Iraq, Libya, Syria and Yemen continues to displace millions of people annually. For this reason, the report is focused on weapons exports to this region.

*“Across MENA throughout 2018 thousands of dissidents and peaceful critics have been victims of shameless government violations on a shocking scale, amid deafening silence from the international community,”*

Amnesty International’s regional director Heba Morayef<sup>7</sup>

Failure to manage the trade and export of arms responsibly has devastating impacts on the lives of civilians. Where arms are exported to repressive regimes these can impact on people’s right to life, right to peaceful assembly and association, and right to free expression. Where arms are exported to conflict regions, these can lead to the damage and destruction of civilian infrastructure, such as schools, hospitals, housing, and water and sanitation. This directly impacts the population’s enjoyment of their economic, social and cultural rights, such as the right to health, water, education, adequate food, and adequate housing,<sup>8</sup> as well as the potential loss of life.

While states have the primary obligation, it is not their sole responsibility to ensure that weapons exports conform to IHL. Arms companies too, bear a responsibility to ensure that their products are not used to perpetuate genocide, harm civilians, in crimes against humanity, or other war crimes, i.e. that their arms and their exports conform to IHL. The UN Guiding Principles on Business and Human Rights (UNGPs) make it clear that the corporate responsibility to respect human rights “exists over and above compliance with national laws and regulations”. It is therefore not sufficient for defense companies to claim that states have the regulatory burden and that weapons companies simply comply or conform to this. It is also reiterated by the UNGPs that “in situations of armed conflict enterprises should respect the standards of international humanitarian law” (Guiding Principle 12).

## THE WAR IN YEMEN

Nowhere is the devastating impact of the arms trade more apparent than in the current war in Yemen. The poorest country in the Middle East is currently hosting a war of two of the wealthiest, oil-rich countries, with the primary victims being those who cannot defend themselves. Not only are civilians, many of whom are children, dying in the midst of combat air strikes and artillery fire, but also from the devastating effects of a war associated with the bleakest humanitarian situation, malnutrition, cholera, and disease. This conflict continues to take a heavy toll on civilians in Yemen, with an estimated 22 million Yemenis in need of assistance and, according to the UN, 15,000 people killed or injured.

All sides of the conflict have reportedly violated human rights and international law. Since 2015, research by credible human rights organisations such as Human Rights Watch, Amnesty International and others have consistently demonstrated actions taken by the Saudi-led coalition in Yemen in violation of international humanitarian law (IHL). In certain cases evidence has been gathered linking US and UK arms used in the destruction of civilian targets, resulting in civilian casualties including children. These incidents can be linked to arms companies, including Rheinmetall, Raytheon, Lockheed Martin, BAE Systems and MBDA (a joint company owned by BAE, Leonardo and Airbus).

Arms exports to the Saudi-led coalition are in clear violation of human rights principles and the failure of defense companies to prevent these exports has put banks and investors at extreme risk of being linked to these human rights violations.

Global defense companies, however, continue to export to countries with unfree, authoritarian regimes; to conflict zones; to fragile states; and to countries with exceedingly high levels of government corruption in defence procurement. The export to these countries is widely seen as undesirable and there is a serious risk that arms supply in these cases results in increased human rights violations. This document is focused on those countries in the MENA region that can be defined as controversial for arms exports. The definition uses internationally renowned indices and standards, as given by the methodology in the PAX report, “Controversial Arms Trade: A case study prepared for the Fair Insurance Guide”.<sup>9</sup>

## What banks need to know:

Finance provided to arms companies allows them to carry out their operations, to develop new weapons and to export to new markets. The obvious impact that arms transfers has on human rights, and their potential association with gross human rights violations,



means that banks must consider carefully the behaviour of arms companies before providing financing or investments.

The UNGPs apply to all business enterprises, **including commercial banks and other entities in the financial sector**,<sup>10</sup> meaning that banks must apply the requirement by the UNGPs “to respect human rights for all businesses wherever they operate”. Equally, they apply to any company or commercial vehicle from any other sector that may be a client of, or enter into a business relationship with, a bank.<sup>11</sup> The responsibility to protect human rights applies therefore to all actors, equally – both to banks and to arms companies.

It is clear that banks must put in place due diligence processes, particularly for those companies or regions which pose high human rights risks associated with their activities and client relationships. Given the specific risks of gross human rights abuses posed by the arms industry, including by fuelling conflict, any dealing with defense companies should trigger an enhanced due diligence process by banks. Where it is clear that defense companies are not taking their responsibilities seriously, i.e. to ensure that their products are not exported to controversial countries, banks are placing themselves at risk of being associated with human right violations. In particular “a bank may facilitate a client or other entity to cause harm, *if it knows or should have known that there is a human rights risk associated with a particular client or project*, but it omits to take any action to require, encourage or support the client to prevent or mitigate these risks.”<sup>12</sup>

By investing in weapons companies which are exporting to controversial countries, banks are placing themselves at risk. Until arms are better regulated by states, and it can be ensured that defense companies are not permitting exports to authoritarian repressive regimes or fragile states, to countries where defence corruption is exceedingly high, or where poverty and military spending are at odds, banks and institutional investors cannot be sure that they are not contributing to human rights violations. Indeed, in some cases where there is evidence of arms being used in the violation of IHL, some of these banks can be seen as potentially profiting from and facilitating human rights violations.

**! This document requests that banks adopt  
● the line that the export of weapons systems to controversial countries is unacceptable – i.e. exports to authoritarian repressive regimes or fragile states, countries where defence corruption is exceedingly high, or where poverty and military spending are at odds.**

## **THE IMPACT OF WAR AND CONFLICT: REFUGEES AND INTERNALLY DISPLACED PEOPLES**

Since 2013 a rising number of refugees have arrived in Europe, largely originating from countries in the MENA region- primarily Syria, Afghanistan and Iraq.<sup>13</sup> In the years that followed, citizens and politicians increasingly demanded that the causes of their flight needed to be tackled in order to put a lasting end to the so-called “refugee crisis”. They also pointed out that European countries are partly responsible for the humanitarian crises that led to the flow of refugees and must therefore participate in finding a solution.

This demand can clearly be applied to the continued weapon exports by European countries to states that are actively involved in the refugee-producing countries. For instance, as shown in this report, Saudi-Arabia regularly received and continues to receive weapons from European states, whilst being involved in proxy wars in Yemen or Syria.<sup>14</sup> In both wars, Saudi Arabia is supporting opposition forces – financially and militarily. European weapons exported to Saudi-Arabia were therefore used on the battlefields of the Yemeni and Syrian civil war.<sup>15</sup> This did not ease the situation, but rather increased the level of violence and militarization of the conflict, constantly worsening the situation for citizens.<sup>16</sup> As a result, a growing number of civilians were forced to leave their homes.

In Yemen, this was mainly reflected in Internal Displacement, with 3.3 Million Yemenis currently being internally displaced.<sup>17</sup> In most cases, the only difference between a refugee and an Internally Displaced Person (IDP) is that the latter has not crossed an international border. Although IDPs are not considered as refugees, they may face the same difficulties and more, as they have to remain in or nearby areas of conflict and are more often than not forgotten by the international community.<sup>18</sup>

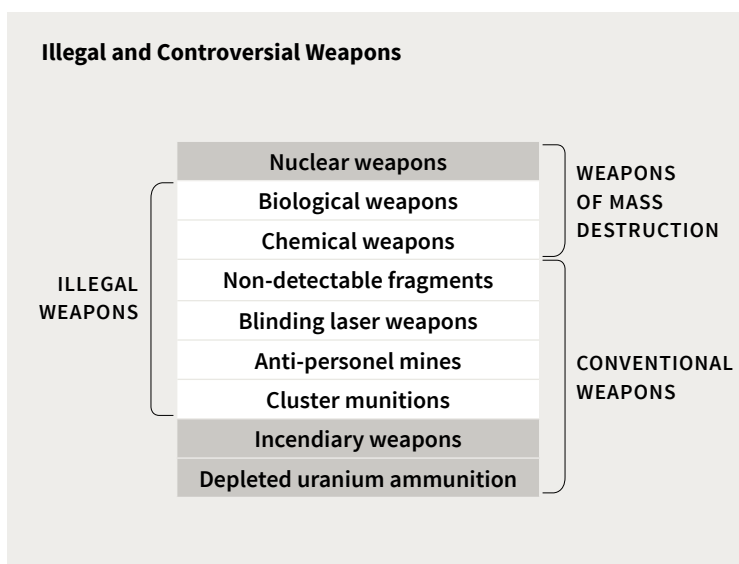
Unlike Yemeni civilians, Syrians are able to flee across international borders and about 5.6 million Syrians are currently refugees.<sup>19</sup> Most of the Syrian refugee population settled in neighboring states, but roughly 1 million Syrians arrived in Europe.

Weapon exports to countries involved in civil wars not only results in an increasing number of refugees, but further complicates peace negotiations, as the conflicts get more violent and militarized. This consequently leads to an elongation of war, aggravation of the humanitarian situation and increase of civilian casualties.

# Controversial Weapons – the role of Defense Companies and Banks

Key components in international and humanitarian law are the concepts of “proportionality” and “distinction”. These concepts regulate and limit the type of weapons that can be developed and used, amongst others. Weapons that don’t allow for distinction between combatants and civilians and that can cause incidental loss of civilian life excessive in relation to the anticipated military advantage gained should not be produced. The prohibition and restriction of certain types of weapons is an attempt to limit the suffering of both civilians and combatants in armed conflict. The diagram below shows the illegal and controversial weapons.

All the weapons listed in the diagram below are considered to be controversial. Nuclear weapons are not labelled as illegal as the Treaty on the Prohibition of Nuclear Weapons which prohibits nuclear weapons and considers them illegal under international humanitarian law has not yet entered into force, although the treaty on non-proliferation entered into force in 1970. However, banks should not be invested in companies that produce weapons that, through their normal use, may violate fundamental humanitarian principles. Nuclear weapons are included among these.



A potential addition to the category of controversial weapons is the development of so called Lethal Autonomous Weapon Systems (LAWS). This relates to the increasing levels of autonomy of weapons systems and the associated reduction in human involvement in the decision to use force. In fully autonomous systems, the system itself will – without human intervention – be able to choose when, against whom, and how it will use force. Lethal Autonomous Weapons, once activated, using sensors and/or artificial intelligence, will be able to operate without meaningful human control over the critical functions.

There are serious concerns over whether these weapon systems could ever meet the existing concepts of “proportionality” and “distinction” in international humanitarian law (IHL). According to an International Committee on the Red Cross (ICRC) assessment, where Autonomous Weapon Systems (AWS) do not have meaningful human control over their critical functions of selection and attack, they should be considered to be in violation of IHL. When considering the laws of distinction, proportionality, and precautions in attack “it seems evident that overall human control over the selection and attack of targets will continue to be required to ensure respect for IHL.”<sup>20</sup> In November 2018, the ICRC highlighted at the Convention on Certain Conventional Weapons (CCW) “It is not machines that ‘apply’ or ‘respect’ the law, it is humans who are responsible and accountable for respecting the law.”<sup>21</sup>

The rapid technological development towards LAWS remains currently unregulated. Weapon systems which have been deployed today, could be more accurately defined as highly automated systems, but with increasingly autonomous functions. A future where robotic weapons are able to select and attack individual targets without any meaningful human control could be reality in years rather than decades from now, and is strongly opposed by many countries as well as scientists, religious leaders, civil society, and even robotics companies.

This report shows some examples of developments by the top ten global arms companies in the field of autonomous weapons. While the more advanced of these systems are often prototypes, it highlights that the sophisticated technology is already available for these weapon systems. The progress of these systems with increasing autonomy is therefore starting to place the development of norms outside of a regulatory control system.<sup>22</sup>

## WHAT BANKS NEED TO KNOW:

Banks and investors have on the whole been aware of companies developing controversial weapons or those illegal under international law, and many have developed criteria for excluding producers of these weapons. The global ban on cluster munitions has resulted in the overall number of financial institutions investing in producers of cluster munitions, falling from 166 in 2017 to 88 in 2018.<sup>23</sup> The reputational risk associated with financing these types of weapons which cause such wide-scale and indiscriminate harm, as well as the regulatory issues has reduced investments in producers. The report “Don’t Bank on the Bomb” also illustrates clearly which financial institutions continue to profit from the production of nuclear weapons. Despite some banks lagging, there has been a wide acceptance by banks and institutional investors that illegal and controversial weapons have no place in investment portfolios. This document shows however, that many of the ten largest global companies are still involved in the production of nuclear weapons or their components and are still receiving finance and investment from large European banks.

The reputational risk banks face when investing in controversial weapons systems that are widely opposed for their immoral and destructive results, are clear. While autonomous weapon systems have not yet been banned, it is evident that there is opposition by many countries and civil society to their development and use. It is also clear that the use of lethal autonomous weapons would violate the principles of IHL in terms of proportionality and distinction. It is for these reasons that the development, production and testing of LAWS, which can select and engage targets without meaningful human control over individual attacks, is unacceptable.

The UN Guiding Principles on Business and Human Rights (UNGPs) are clear that the commitment to respect human rights “exists independently of States’ abilities and/or willingness to fulfil their own human rights obligations, and does not diminish those obligations. And it exists over and above compliance with national laws and regulations protecting human rights.” The UNGPs make clear that business’ human rights due diligence should assess potential as well as actual human rights impacts. It is possible that the production and testing of LAWS would constitute a potential adverse human rights impact.<sup>24</sup>

This means that banks have the obligation to undertake due diligence to ensure that they are not associated with human rights violations. In relation to autonomous weapon systems, banks can and should monitor the development of these systems. Technological development of autonomous weapons is rapid, and opposition is strong – for this reason, investments in producers could be a reputational concern for banks to be linked with companies that are moving swiftly towards the development of autonomous weapon systems. This document serves to bring this issue to the attention of banks, to encourage engagement with clients who may be involved in the development of autonomous weapons systems. *An introductory list is provided in the appendix: “Heading towards autonomy? A potential watchlist.”*

**! This document requests that banks adopt the ● line that the “Development, production and testing of lethal autonomous weapons systems, which can select and engage targets without meaningful human control over individual attacks, is unacceptable.”**

# Methodology

## COMPANY SELECTION:

The defense companies were selected based on the SIPRI Top 100 arms-producing and military service companies 2017.<sup>25</sup> The nine largest defense companies globally were selected.<sup>26</sup> Additionally, the two largest German defense companies were included.<sup>27</sup>

The report covers exports by the aforementioned companies to countries defined as controversial in the Middle East and North Africa (MENA) region, as well as exports to the Saudi-led alliance active in the war in Yemen. The report also looks at the eleven companies and their involvement in the production of controversial weapons systems – nuclear weapons and cluster munitions, as well as emerging technologies in the field of Autonomous Weapon Systems.

## DEFINITION OF CONTROVERSIAL ARMS TRADE:

The definition of the controversial arms trade is given in this study, as in the 2015 report by PAX.<sup>28</sup> “Controversial arms trade relates to the supply of (important parts of) weapons and weapon systems, military transport systems and other military goods, as referred to by the Common Military List of the EU, to:

- countries under an UN/EU arms embargo;
- unfree countries;
- countries involved in a (civil) war;
- countries with a high risk of corruption in military procurement;
- countries considered a fragile state; and
- poor countries spending a disproportionate share of their government budget on weapons.”

Based on the above definition of controversial arms trade, **the following countries in the MENA region have been included:** Azerbaijan, Bahrain, Egypt, Iran, Iraq, Lebanon, Libya, Mauritania, Saudi Arabia, Somalia, Sudan, South Sudan, Syria, United Arab Emirates (UAE), Turkey, Yemen.

**The following countries in the MENA region have not been included:** Algeria, Armenia, Djibouti, Israel, Jordan, Morocco, Oman, Qatar, Kuwait.

**In addition, exports to those countries involved in the Saudi-led coalition in Yemen have been included:** Saudi Arabia, Bahrain, Egypt, Jordan, Kuwait, Morocco, Sudan, UAE.

There is also an overlap between some of the countries in the Saudi-led coalition, which are themselves considered to be controversial for arms trade based on the criteria given above and the overarching definition of controversial arms trade.

## EXPORT DATA:

The export data covers the time period 2015–2018. The data is extracted from the Stockholm International Peace Research Institute (SIPRI) arms transfer database and was extracted on 14 November 2018, updated data was then extracted from the transfer database on 12 March 2019 and added to the export tables. The company producing the weapon is not provided in the database and online research was undertaken to allocate weapon systems to companies.

It is important to note in relation to the arms companies that some of the companies, such as Boeing, Airbus and ThyssenKrupp have diversified business segments and are not only producing arms. However, for the financing of these companies it is possible to look only at financing and investments in the overarching companies and not into specific business sectors, as this information is not available. This means that banks will often claim that they are not funding the part of the business producing weapons, but only those sectors producing civilian aircraft for example. However, financing provided as well as investments are more often than not used to fund the entirety of the organisation.

#### DEFINITION OF AUTONOMOUS WEAPON SYSTEMS:

A potential addition to the category of controversial weapons is the development of so called Lethal Autonomous Weapon Systems (LAWS). This relates to the increasing levels of autonomy of weapons systems and the associated reduction in human involvement in the decision to use force. More than 380 partly autonomous weapon systems have been deployed or are being developed in at least 12 countries, including China, France, Israel, Republic of Korea, Russia, the United Kingdom, and the United States. Fully autonomous weapons are different than for example armed drones. Drones, or “uncrewed aerial vehicles” (UAVs), are remotely piloted by humans. Human operators fly the drones by remote control, select targets, and choose when to fire upon those targets. A fully autonomous weapon would be programmed so that once it is deployed, it operates on its own.<sup>29</sup> It would be able to select and fire upon targets all on its own, based upon its algorithms and data analysis programming using sensors and/or artificial intelligence and will be able to operate without meaningful human control over the critical functions.

There are serious concerns over whether these weapon systems could ever meet the existing concepts of “proportionality” and “distinction” in international humanitarian law (IHL). According to an International Committee on the Red Cross (ICRC) assessment, where Autonomous Weapon Systems (AWS) do not have meaningful human control over their critical functions of selection and attack, they should be considered to be in violation of IHL. The rapid technological development towards LAWS remains currently unregulated. Weapon systems which have been deployed today, could be more accurately defined as highly automated systems, but with increasingly autonomous functions. This report shows some examples of developments by the top ten global arms companies in the field of (semi-)autonomous weapons. While the more advanced of these systems are often prototypes, it highlights that the sophisticated technology is already available for these weapon systems. The progress of these systems with increasing autonomy is therefore starting to place the development of norms outside of a regulatory control system.<sup>30</sup>

#### SELECTION OF BANKS:

In selecting the banks for the study, the financial data for loans, bond and equity underwritings to the defense companies for the period 2015–2019 was assessed. The European banks that had provided finance to more than one company were selected. This led to a list of 13 banks. This list was further reduced to include only: the top two banks from Germany, the UK, Spain, and France, as well as the only Swiss bank and Italian bank.

This led to the selection of the following banks: Deutsche Bank, Commerzbank, Lloyds, Barclays, Credit Agricole, BNP Paribas, BBVA, Banco Santander, Credit Suisse, UniCredit.

#### FINANCIAL DATA:

The financial data is extracted from the ThomsonEikon database. This does not include all financial data, only that which the database holds, however, it provides an indication of the financing and investment provided.

Data was extracted for loans, bond issuances and equity underwritings for the period November 2015 to January 2019. Data was also extracted for shareholdings and bond holdings on the 15 January 2019. Where a syndicate of banks provided financing, but a breakdown of each bank’s contribution was not provided, the amount was divided evenly by the number of banks. Often underwritings of shares and bonds were also based on similar estimations due to a lack of detailed data.

## What type of finance is covered and why?

### DIRECT FINANCE (CORPORATE LOANS AND PROJECT FINANCE):

The easiest way for companies to obtain capital is to borrow money. In most cases, money is borrowed from commercial banks in the form of corporate loans or project financings. The proceeds of these corporate loans are usually declared for 'general corporate purposes' and can therefore be used for all activities of the company, thus also including potentially contentious business segments.

Where loans are provided, all loans allocated as general corporate purpose that are linked to the company are included. All other loans have been reviewed and investigated. Those loans that do not relate to the activity of the company being investigated in this report are excluded. This has been applied where information and detail is provided on the destination of allocated funds.

### UNDERWRITING OF SHARES AND BONDS (ISSUANCES):

Selling shares and bonds to private and institutional investors is another important way for companies to increase their equity or loan capital. By offering underwriting services, banks ensure that there are sufficient buyers for those shares and bonds and that the companies receive the best possible return on investment. Financial institutions (FIs) initially take over (all or) part of the newly issued shares or bonds to sell them to other interested investors, thus acting as intermediaries. After the successful placement of the shares or bonds on the market, the FIs as market makers keep them tradable. This requires them to always hold a number of that particular share or bond in order to be able to react to market demands.

### MANAGEMENT OF SHARES AND BONDS (HOLDINGS):

While FIs emphasise that it is important to differentiate between investments they make with their own capital versus holdings that are acquired on behalf of clients, they do not provide detailed numbers regarding these transactions, making it difficult to determine their exact level of financial benefit from harmful businesses and operations. Nevertheless, FIs benefit from these investments alongside their clients, even if they do not own the investments, (i.e. through client fees). Furthermore, they facilitate the availability of capital for the companies by keeping their shares and bonds liquid on the financial markets, hence making them more attractive to potential investors. Even more importantly, FIs (can) have a significant influence on companies as large-scale shareholders, granting them the right to vote and act as socially responsible investors.

### IMPORTANT NOTE:

When referring in this document to financings we mean loans, bond issuances and equity underwritings. When referring to investment we mean shareholdings and bond holdings.

### ASSESSMENT OF BANKS:

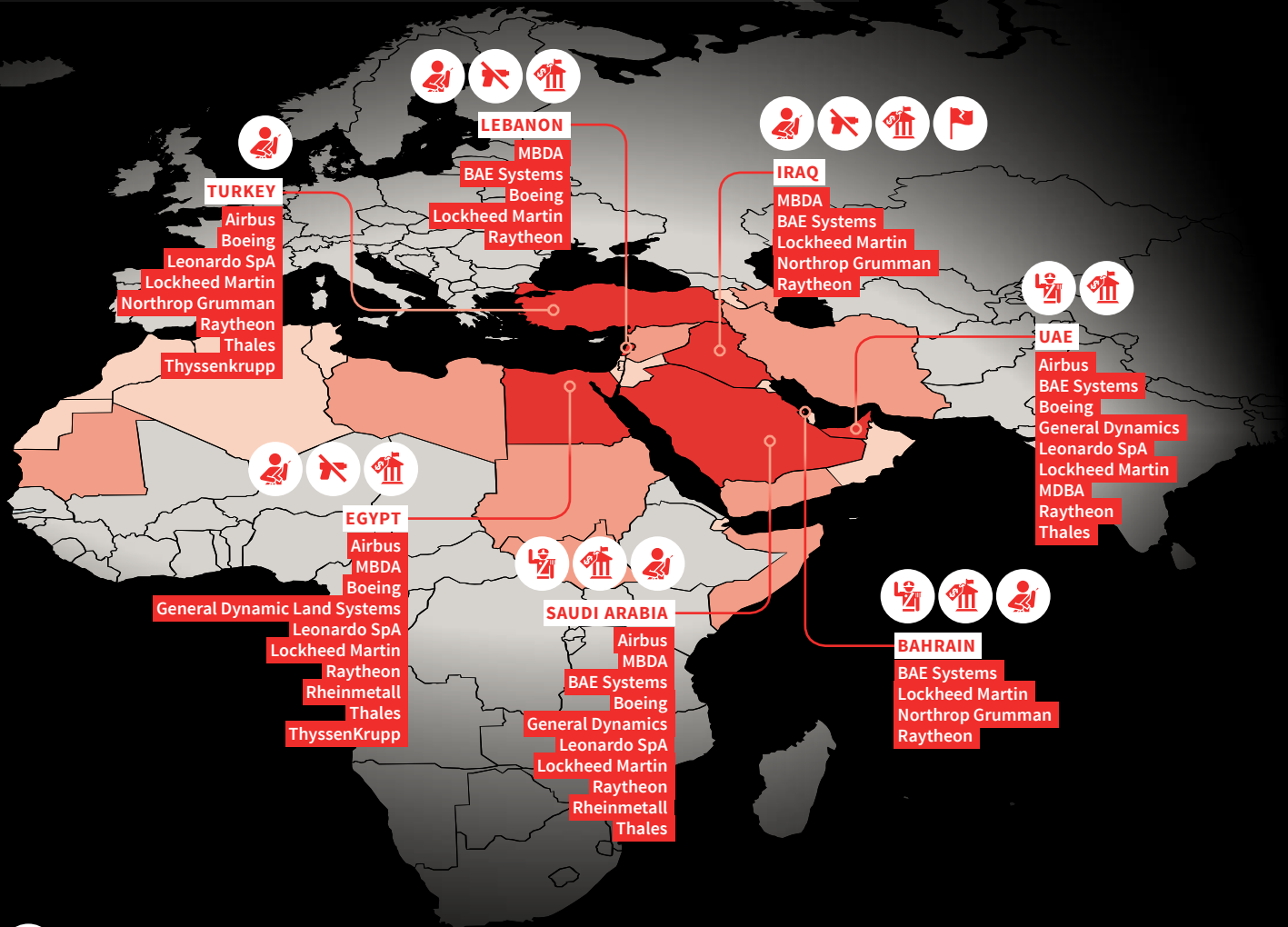
The bank policy assessment has been undertaken with the help of the methodology\* from the Fair Finance Guide. Some of the banks in this study are rated and ranked by the Fair Finance Guide in their respective country. These include Deutsche Bank and Commerzbank covered by the Fair Finance Guide Germany, BNP Paribas and Credit Agricole covered by the Fair Finance Guide France, as well as Santander covered by the Fair Finance Guide Brazil. The UK, Italy and Switzerland were assessed by Facing Finance using the methodology of the Fair Finance Guide. Banks were also shown their results and asked for comments and further information.

\* Methodology for the Fair Finance Guide is available on the Fair Finance Guide.de Media tab: <https://www.fairfinanceguide.de/media/494821/ffgi-policy-assessment-2018-methodology-180308-edited-181212.pdf>



A blast from a 155mm, high explosive (HE) round fired from a M109A6, medium self-propelled Howitzer.  
© US Army via Flickr CC-BY-2.0

# Controversial Countries for Arms Exports: MENA region



- Unfree authoritarian regime
- Corruption
- EU / EU & UN arms embargo
- Armed conflict
- Fragile state

- Not controversial for arms exports
- Controversial for arms exports no evidence of exports
- Controversial for arms and evidence of exports by companies



## Azerbaijan



Azerbaijan has been included as a controversial country for arms export due to its classification as an unfree country with high levels of corruption in the defense sector. Azerbaijan's authoritarian government has ruled since 2003, there is rampant corruption and due to persecution, there is limited formal opposition, in recent years there has been an extensive crackdown on civil liberties and independent expression or activism is severely repressed.<sup>31</sup>

Rated as "not free" by Freedom House and scoring a freedom rating 6.5/7, political right 7/7 and civil liberties 6/7. Aggregated score: 12/100.

## Bahrain



Bahrain in this report is considered as being in armed conflict. Bahrain is considered one of the Middle East's most repressive states with the monarchy systematically dismantling opposition and cracking down on dissenters. The Bahraini government continues to respond to political opposition in a repressive and violent fashion, including in Bahraini security forces' 26 January 2017 use of live ammunition in an attack on protesters in Diraz.<sup>32</sup> In addition, the country also falls in the highest risk category for corruption in defence spending, particularly in procurement. In addition, the country also falls in the highest risk category for corruption in defence spending.

Rated as "not free" with a score in freedom rating 6.5/7, political right 7/7, civil liberties 6/7. Total score 12/100.

## Egypt



Egypt is considered to be in armed conflict and an EU arms embargo has been in place since August 2013. This arms embargo includes "any equipment which might be used for internal repression". In contrast to general arms embargoes, this arms embargo is not legally binding and the frame has become unclear.<sup>33</sup> The Egyptian government is also considered to be in armed conflict, predominantly due to the fight against the Islamic State (IS), which takes place mostly in the Sinai Peninsula.<sup>34</sup> There have been reports of human rights violations committed by the Egyptian military in North Sinai.<sup>35</sup>

Egypt is ranked as having the highest risk in relation to government corruption in the defence sector.

## Iran



A UN arms embargo was put in place against Iran in 2007 to prevent the development of technology related to nuclear weapons and was extended in 2010 to cover the export of most major conventional weapons.\* This embargo remains in place, however in 2015 it was amended to allow certain exports with express permission from the UN Security Council.<sup>36</sup> The EU arms embargo relates also to the concern around the development of nuclear weapons, but additionally to concerns about the human rights situation and that equipment may be used for internal repression.<sup>37</sup> The EU imposed a full arms embargo on Iran since 2007. The Iranian government is also considered to be in armed conflict, predominantly with the IS, but also with assorted groups attempting to overthrow the current government and conflict in relation to the interests around Kurdistan.<sup>38</sup>

\* battle tanks, armoured combat vehicles, large calibre artillery, combat aircraft, attack helicopters, warships, certain missiles and missile launchers.

## Iraq



Prior to 2004 there was an arms embargo on Iraq. But since the formation of the government, both the UN and EU arms and other embargoes were partially lifted and allow the sale, supply, transfer or export of arms and related material only to the Government of Iraq. Restrictions remain in force on non-government forces. According to Freedom House, democratic governance is impeded in practice by corruption and security threats, including militant groups such as the IS. The country is noted as being in conflict in 2017. While the terrorist attacks reportedly declined, IS maintained enough of a presence to carry out several large-scale bombings in Iraqi cities outside the main conflict zones. Iraq is also experiencing high levels of instability, poverty and conflict, and is therefore still considered to be a fragile state with high unrest and turmoil.

## Lebanon



The UN arms embargo was established in 2006 to help the Lebanese government exercise full sovereignty over all Lebanese territory. The arms embargo is on non-governmental forces, thus the embargo does not apply to the Government of Lebanon, but it does apply to all arms transfers to Lebanon not authorized by the Government or the United Nations Interim Force In Lebanon.<sup>39</sup> The conflict over government in Lebanon flared up again in 2014, in part due to conflicts with IS.<sup>40</sup> In addition, defence corruption in Lebanon is high and of concern.



### Libya

The UN established an embargo including the supply of arms and military equipment from and to Libya in February 2011. In September 2011, supplies to the new Libyan National Transition Council (NTC) have been allowed, if approved by the Sanctions Committee. However, control over the transportation and stockpiling of arms in Libya is weak, there is no guarantee into whose hands these arms will ultimately fall. The embargo was established due to systematic violation of human rights, including repression of demonstrators by the government. In September 2011, after they took control, the Libyan opposition forces were accepted by the UN General Assembly as the new Libyan government.<sup>41</sup> Following an election in 2014, two forces claimed power resulting in armed violence in 2014 and 2015, this conflict became active again in 2017.<sup>42</sup> Due to the problematic government situation and other criminal and extremist groups, violence increased and the human rights conditions decreased. It also led to displacement of hundreds of thousands of people.<sup>43</sup>

The aggregated score is 9/100 with freedom rating 6.5/7, political rights 7/7 and civil liberties 6/7.



### Mauritania

Mauritania is considered a country in conflict due to concern around the war in neighbouring Mali, which generates instability at Mauritania's eastern and southern borders, including the threat of armed groups roaming across the region. Attacks against the UN mission in Mali are on the rise and violence is moving south of Mali.<sup>44</sup>



### Saudi Arabia

Saudi Arabia is considered to be a country in conflict in relation to its key role in the war in Yemen. IS also carried out attacks in Saudi Arabia in 2015 and 2016. The conflict over government between the Government of Yemen and forces of Hadi, backed by the Saudi led coalition, continued unabated in 2016 and 2017. This conflict has taken an enormous toll on the civilian population in Yemen.<sup>45</sup> (See more in the feature article in this document). Saudi Arabia is also considered an unfree country, with very low freedom ratings and almost all political and civil liberties are restricted and controlled. No officials at a national level are elected, there is discrimination in both law and practice towards women and religious minorities.<sup>46</sup> In addition, Saudi Arabia has an extremely high risk of government corruption in the defense sector.

Aggregated score: 7/100, freedom rating 7/7, political rights 7/7, civil liberties 7/7.



### Somalia

There is currently a UN arms embargo in place in Somalia. This was changed in 2007 to allow arms supplies to the Somali government forces only.<sup>47</sup> This arms embargo is supported by the EU.<sup>48</sup> Somalia is also considered to be in armed conflict due to the struggle with varied insurgent groups, such as Al-Shabaab.<sup>49</sup> It is also rated as having a high risk of corruption in defence procurement. Somalia is divided in three parts, one led by an internationally supported national government, the other by the Shabaab militant group and the third by a separatist government. No direct national elections have been held to date and the country is noted as unfree.<sup>50</sup>

Somalia has an aggregated score of 7/100 with freedom rating 7/7, political rights 7/7, civil liberties 7/7.



### Sudan

The Sudan is considered an unfree authoritarian regime.<sup>51</sup> In reaction to the ongoing human rights abuses and deteriorating humanitarian situation in the region, the UN imposed an arms embargo on the Darfur region. It included non-state actors and was expanded to the Sudanese government in the Darfur region in 2005. This was again strengthened to ensure that arms did not find their way to Darfur.<sup>52</sup> The EU also implemented this UN arms embargo, and included South Sudan.<sup>53</sup> In 2011, the South Sudan became independent, after a majority of the population voted for independence. With the independence of South Sudan, a new conflict regarding the common border region emerged. Other conflicts also emerged, for governance, religion and cultural division of the country, conflicts with other states, such as Uganda and Yemen, and conflict against rebel alliances.<sup>54</sup> Sudan is also part of the Saudi-led coalition in Yemen, providing mostly ground troops. South Sudan is suffering from a severe civil war since 2013, when the government divided itself. This war led to violent crimes against civilians, journalist and aid workers as well as an economic collapse.

The aggregated score for Sudan is 8/100 with freedom rating 7/7, political rights 7/7, and civil liberties 7/7. South Sudan has an aggregated score of 2/100 with all three categories in 7.

## Syria



In May 2011, the EU imposed sanctions on Syria in response to the violent repression by Syrian government forces of peaceful protests. This was partly lifted in 2013, excluding only the transfer of specific equipment.<sup>55</sup> The league of Arab States also imposed economic and financial sanctions against the Syrian government. The Arab Spring, where the government violently repressed demonstrators, had a major impact on the country leading to a civil war which included many different rebel groups, the government and almost all major international powers. Former conflicts fuelled the war, including revolts against the ruler.<sup>56</sup>

The country is considered to be an unfree, authoritarian regime which represses almost all civil liberties and political rights.<sup>57</sup>

Aggregated score: -1/100. Freedom rating 7/7, political rights 7/7, civil liberties 7/7.

## United Arab Emirates (UAE)



The UAE is a federation of seven emirates led in practice by Abu Dhabi. The UAE has banned political parties, and all executive, legislative, and judicial authority ultimately rests with the seven hereditary rulers. The civil liberties of both citizens and noncitizens, who make up an overwhelming majority of the population, are subject to significant restrictions.<sup>58</sup> The political system grants the emirates' hereditary rulers a monopoly on power and excludes the possibility of a change in government through elections.

Aggregated score: 17/100. Freedom rating 6.5/7, political rights 7/7, civil liberties 6/7.

## Yemen



The UN established an arms embargo, which was implemented shortly afterwards also by the EU. The arms embargo was imposed because of the conflict and deteriorating humanitarian situation in the country and applies to several armed groups. It is an annual embargo, which has been extended until February 2019.<sup>59</sup> This is an embargo on non-governmental forces. The violence in the country has quickly escalated with severe consequences for civilians. Forces of Hadi are supported by a Saudi-led coalition.<sup>60</sup> The devastating civil war that began in 2015, has led the country to be classified as unfree and lacking in political and civil liberties.

Aggregated score: 13/100. Freedom rating 6.5/7, political rights 7/7, civil liberties 6/7.

## Turkey



Turkey is a country currently engaged in armed conflict. Turkey has experienced state-based violence both by groups challenging the governmental power to change the political system in Turkey and by groups challenging the government for territorial claims. In 2016, the conflict between the Government of Turkey and the Kurdistan Freedom Hawks (TAK) became active for the first time due to two deadly bombings targeting government posts in Ankara and Istanbul respectively. In the late evening of 15 July 2016, units from the Turkish armed forces, operating under the name The Peace at Home Council YSK tried to take control of the government, state institutions, national media and key points of communication in the country. The failed coup attempt led to the death of close to 300 people.<sup>61</sup> Turkey is in conflict in Syria, and it has conducted airstrikes as part of the US coalition, and unilateral airstrikes in northern Syria.<sup>62</sup> Human Rights Watch has raised concern around the death of civilians and human rights violations in Syria related to Turkish military operations.<sup>63</sup>

# Company Profiles



## Finance provision Airbus SE (in € millions)

Deutsche Bank	558.38
BNP Paribas	383.51
UniCredit	342.73

## Investment in Airbus SE (in € millions)

Crédit Agricole	1,769.15
Deutsche Bank	569.04
BNP Paribas	445.45

Airbus SE is a multinational aerospace company, with its headquarters in the Netherlands. While just 15% of its total revenue comes from its Defence and Space business segment, it is still the second largest defense supplier in Europe<sup>64</sup>, and according to the Stockholm International Peace Research Institute (SIPRI) data for 2017 the 7th largest defense company in the world.<sup>65</sup> It had total earnings of €4.3 billion, with Defense and Space earning €872 million in 2017. Airbus has a statement on human rights and is a signatory to the UN Global Compact. Airbus also claim that through their delivery of products they are contributing to a safer and more prosperous world.<sup>66</sup>

Airbus (37.5%) is part of the joint venture with Leonardo (25%) and BAE Systems (37.5%) in the company MBDA, which produces missiles and missile systems. MBDA is also producing increasingly autonomous weapon systems. More information is given under the company profile for Leonardo.

## EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

Airbus has exported transport aircraft<sup>67</sup> to Egypt, Saudi Arabia, Turkey and the UAE. There has been an arms embargo on Egypt since 2013 for any weapons that could be used for internal repression. Arguably transport aircraft do not fit the description covered by the arms embargo. However, Egypt is also a country defined as in armed conflict, due to its operations against IS fighters in Sinai peninsula. This has involved severe restrictions on civilians and Human Rights Watch warned in early 2018 of a humanitarian crisis in the region.<sup>68</sup>

The UAE is considered an unfree country which suppresses civil liberties, detains human rights activists, and has violently cracked down on opposition to the rulers – Airbus has also exported reconnaissance satellites to the UAE.<sup>69</sup> It is possible these can be used for crowd control.

## EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

Airbus has exported transport aircraft, helicopters and reconnaissance satellites to countries participating in the war on Yemen – the UAE, Saudi Arabia and Egypt. All of these were delivered either in 2015 or thereafter, after the war in Yemen had begun. The Airbus A330 MRTT are used in the war with Yemen for refuelling operations, Saudi Arabia has a fleet of six of these aircraft (3 of which were delivered by Airbus in 2015).<sup>70</sup> Britain's foreign office admitted in 2016 that British-made and licensed Brimstone and Storm Shadow missiles had been used in combat missions by Saudi air forces in Yemen, as had Typhoon and Tornado aircraft, made by the companies MBDA and through the Eurofighter consortium respectively.

**Exports to Saudi Arabia and the UAE are considered controversial for arms exports, both due to their role in the war in Yemen and also due to them being considered as unfree countries.**

### Airbus has exported to:

- Egypt                      → Turkey                      → Kuwait
- Saudi Arabia              → UAE

### Through the consortium MBDA and Eurofighter, Airbus has exported to:

- Egypt                      → UAE
- Saudi Arabia              → Kuwait

*i] More detail on specific exports is given in Appendix 1: Export data*

## PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:

Airbus does not produce cluster munitions, but the Airbus Group does produce key components for both submarine and air launched French nuclear missiles. Through its joint venture MBDA, Airbus is providing medium-range air-to-surface missiles to the French air force. The new MBDA – Larsen & Toubro joint venture, will also produce missiles for the Indian arsenal- it is unclear whether these are nuclear or conventional missiles.<sup>71</sup> →



MMP-Anti-tank UGV © Facing Finance

It is also advancing in the field of autonomy in weapon systems. One example is in the field of manned-unmanned teaming. In October 2018, Airbus demonstrated five Airbus-built Do-DT25 target drones controlled from a manned command and control (C2) aircraft. While a human pilot controls the behaviour of the swarm, it does not control the individual drones.<sup>72</sup> The drones interact intelligently with the aircraft and demonstrate automatic guidance, navigation, and control.<sup>73</sup> The drones would be able to support the crew of the aircraft with reconnaissance, disrupting enemy radar and communication, and potentially also fighting should they be armed.<sup>74</sup>

The specific concern around drone swarms, among others, relates particularly to the issue of an autonomous arms race: “Early experiments indicate that the only effective protection against attacking swarms may be defensive swarms”. It is easy to see how this type of development could lead to an arms race focused on these types of technologies.<sup>75</sup> Additionally, malware or hacking one drone in a swarm could trigger cascading changes across the entire swarm.<sup>76</sup>

Drone swarms are an essential part of the Future Combat Air System (FCAS) which Airbus and Dassault Aviation will develop and produce. It aims to connect a range of manned and unmanned air platforms, including a next-generation fighter aircraft, Medium-Altitude Long-Endurance Unmanned Aerial Vehicles (UAVs), the existing fleet of aircraft such as the A400M and Eurofighter, future cruise missiles, and combat drones flying in swarms. Airbus intends to make each component smarter by connecting them via satellite and cyber-secured networks. The next-gen aircraft would be at the heart of FCAS, able to control unmanned platforms to autonomously carry out multiple tasks.<sup>77</sup>

MBDA and Milrem Robotics showcased the MMP-Anti-tank UGV, the world’s first anti-tank unmanned ground vehicle (UGV) at the weapons expo, IDEX 2019.<sup>78</sup> The system uses Milrem’s THeMIS UGV which is equipped with a kit for autonomous real-time control and mobility, with MBDA’s MMP missile system integrated.<sup>79</sup> The weapon’s features include in-flight targeting and re-targeting, interactive firing post with autonomous operation and a “fire-and-forget” option that enables the weapon to guide itself to its target.<sup>80</sup> There have been indications by Milrem previously that the THeMIS system has the components to be able to “interpret what it sees, identify likely combatants and target them, on its own”.<sup>81</sup>

# BAE Systems

## Finance provision BAE Systems (in € millions)

Barclays	329.83
BNP Paribas	100.13
Commerzbank	100.13

## Investment in BAE Systems (in € millions)

Barclays	823.33
Deutsche Bank	220.43
Credit Suisse	64.90

BAE Systems is an international defense, aerospace and security company. It was, in 2017, the fourth largest arms producer in the world and the largest in Europe with 98% of its revenue coming from the defense sector.<sup>82</sup> BAE's earnings for 2017 for the Group came in at approx €233 million. In 2017, the majority of turnover can be distributed among four countries: the USA 39%, Great Britain 21%, Saudi Arabia 16%, and Australia 3% (other 21%).<sup>83</sup> The top sellers for BAE Systems are the Eurofighter Typhoon and the Lightning F-35 which are produced as part of the Eurofighter consortium. BAE systems has a human rights policy noting a commitment to human rights. In a response to Facing Finance, BAE noted that: "We assess potential export contracts against our own responsible trading principles and we do not proceed with new business opportunities if they do not meet our strict criteria, (even if export licences may have been approved)." However, the volume of exports provided to the Saudi-led alliance bring this approach into question.

In 2010, BAE Systems pled guilty to criminal corruption charges in the UK, paying £300 million to end the case.<sup>84</sup> The case related to arms deals with Saudi Arabia totalling £43 million for which BAE paid bribes to Saudi princes of £6 million.<sup>85</sup> As part of this deal (the Al-Yamamah deal) and the further Al-Salam deal, a vast array of weapons were sold to Saudi Arabia, including Typhoon and Tornado aircraft currently being used in the war in Yemen.<sup>86</sup> In 2016, Campaign Against the Arms Trade (CAAT) brought a legal challenge against BAE saying that arms sales to Saudi Arabia violated export licencing, as the UK "forbid the sale of arms that might be used to commit violations of International Humanitarian Law (IHL)". The court found in favour of the government, proving the absolute government commitment to maintaining arms sales to Saudi Arabia.



Eurofighter Typhoon on offer in Berlin at ILA Airshow 2018 © Facing Finance

BAE Systems (37.5%) is part of the joint venture with Leonardo (25%) and Airbus (37.5%) in the company MBDA, which produces missiles and missile systems. MBDA is also producing increasingly autonomous weapon systems. More info is given under the company profile for Leonardo and Airbus.

### EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

BAE Systems has exported missiles to Iraq and Lebanon, both countries currently in conflict. Iraq is also considered to be a fragile state due to high levels of poverty and instability. Saudi Arabia has received Armoured Personnel Carriers despite being known as a country that represses all civil liberties and freedoms – the government is also known to violently suppress minority groups such as the Shiite. In 2017 thousands of Shiite were evicted which resulted in armed resistance – an unknown number of security personnel, militants, and civilians were killed or injured in the clashes as demolitions proceeded.<sup>87</sup> Additionally, Saudi Arabia is considered a country at high risk of corruption in defense spending. BAE has also exported to Bahrain, one of the most repressive regimes in the world.

### EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

The combat aircraft Hawk-100 has been sold to Saudi Arabia by BAE which is used to train fighter jet pilots (but is also used as a light strike aircraft),<sup>88</sup> allowing Saudi Arabia to increase its fighter fleet.<sup>89</sup> In total 22 Hawks have been delivered to the country. In addition, Armoured Personnel Carriers and recovery vehicles have been delivered. BAE Systems notes that the UK government has stringent export regulations and that their "activities and exports are subject to UK government approval and monitoring."<sup>90</sup> They do not have their own public criteria on exports. →

**BAE has exported to countries experiencing high levels of instability, poverty and conflict. It has exported to countries known to be in armed conflict and to countries that suppress civilian populations. As part of the consortium Eurofighter (Airbus, BAE Systems and Leonardo) and MBDA, BAE systems has exported Typhoon Aircraft and thousands of precision attack weapons to the Saudi coalition countries operating in Yemen.**

Of the missiles sent to the coalition countries, 450 were Storm Shadow cruise missiles, 1,000 Brimstone air-to-surface missiles, 2,000 Mistral portable surface-to-air missiles and 100 Milan anti-tank missiles. The Brimstone missile, a ground or air launched missile, is produced by MBDA in the UK. The weapon is a so-called “fire and forget” weapon and either human operators can pick out targets for the missiles, or in “lock-on mode” it is given a broad area and can search for, select and attack with limited intervention.<sup>91</sup>

#### **Exports by BAE Systems:**

---

→ Bahrain	→ Lebanon	→ UAE
→ Iraq	→ Saudi Arabia	→ Jordan

---

#### **Exports by BAE through the consortium MBDA and Eurofighter:**

---

→ Saudi Arabia	→ Egypt
→ UAE	→ Kuwait

---

*i] More detail on specific exports is given in Appendix 1: Export data*

#### **PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:**

BAE does not manufacture cluster munitions but does provide logistics, systems, and readiness support for the US and UK Navy Trident and US Air Force Minuteman missiles programmes and is thus involved in production of key components of nuclear weapons.<sup>92</sup>

BAE is developing an advanced prototype autonomous stealth drone, Taranis is an experimental drone and is currently not in use. According to the UK Ministry of Defense, Taranis can fly deep into enemy territory to collect intelligence, drop bombs and defend itself with almost no need for operator input.<sup>93</sup> Reportedly, Taranis is able to identify and attack targets autonomously – BAE’s Taranis Programme Manager, Clive Marrison, pointed out that although a human operator currently OKs the attack, an autonomous strike capability could be required in the future.<sup>94</sup>

Another future project that BAE will be involved in is the development of the Tempest stealth fighter. The so-called “Team Tempest” will include engine-maker Rolls-Royce, Italian defence contractor Leonardo, and the European missile consortium MBDA.<sup>95</sup> The fighter will be able to fly unmanned, use swarming technology and incorporate Artificial Intelligence deep learning. It will have offensive and defensive weapons and will be able to control a swarm of other smaller drones. A need for “scalable autonomy” has also been defined, meaning the weapon system can be optionally manned or AI driven. The current plan notes that this aircraft will be demonstrated in 2025 with production in 2035. There are substantial concerns related to the use of AI in weapon systems- malware and manipulation of training data are just two of these.

In addition, Black Knight is a tank that has been developed by BAE, it is an unmanned ground vehicle, able to detect incoming fire and automatically launch counter fire. It can also swing towards any oncoming fire to be prepared for counter fire.<sup>96</sup>

In correspondence with Facing Finance, BAE Systems noted: “While there are obvious benefits to unmanned systems, our view is that there should always be a ‘human in the loop’ when it comes to key decisions, including the use of lethal force. We firmly believe that humans must always be in charge when there is a decision such as the use of lethal force.”



# The Boeing Company

## Finance provision Boeing (in € millions)

Barclays	560.05
Deutsche Bank	553.81
BNP Paribas	527.76

## Investment in Boeing (in € millions)

Deutsche Bank	805.94
Credit Suisse	399.16
Barclays	373.19



The X-45A was the first modern Unmanned Combat Aerial Vehicle (UCAV) designed specifically for combat strike missions.

Above the X-45 is a Predator made by General Atomics.

© Steve Jurvetson CC-BY-2.0.

Boeing is the world's largest manufacturer of civil and military aircraft, defence and security systems, as well as the main provider of air technology to governments and commercial customers. The Boeing Group in 2017 had earnings before tax of \$10.27 billion and the defense business sector had earnings of \$2.2 billion.<sup>97</sup> Boeing is the second largest military and defense company in the world, despite only 29% of its revenue coming from this sector.<sup>98</sup> Boeing acknowledges a strong presence in the Middle East: "The Boeing Defense, Space & Security (BDS)' presence in the Middle East goes back to 1982. Since then, BDS has expanded its relationships across the region with a focus on Saudi Arabia, United Arab Emirates (UAE), Kuwait, Qatar, Oman and Egypt."<sup>99</sup>

## EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

Boeing has exported missiles to Egypt and Saudi Arabia, and helicopters to Turkey, Saudi Arabia and the UAE. Of its exports to controversial countries, most were to Saudi Arabia – including aircraft, helicopters, guided bombs and missiles. The UAE has taken delivery of 5,000 small diameter bombs and 3,600 precision guidance systems from Boeing.

Boeing has exported helicopters and guided bombs to Turkey, the country was not yet considered to be in armed conflict when the licences were agreed, however, it was when they were delivered. Turkey has been part of the US-led coalition in Syria and the UN has reported that in parts of North West Syria civilians under the control of Turkish forces and affiliated armed groups face hardships, which in some instances may amount to violations of international humanitarian law and violations or abuses of international human rights law.<sup>100</sup>

## EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

Egypt is currently in armed conflict against the IS in the Sinai Peninsula and it is also part of the Saudi-led coalition in Yemen. Boeing has exported missiles (Harpoon) to Egypt which were for use on naval ships and submarines. Egyptian naval vessels have been dispatched to Yemen and have taken part in the conflict from the sea in the port of Aden.<sup>101</sup> According to news reports, the ability of the Harpoon to hit land targets from naval vessels was disabled before delivery to Egypt in 2009, with newer deliveries this is uncertain.<sup>102</sup> →

Saudi Arabia bought 650 air to surface missiles to equip their F15 SAs fighter jets.<sup>103</sup> These fighter jets have been used in the war in Yemen.<sup>104</sup> Boeing acknowledges that “The kingdom [of Saudi Arabia] is an important customer for Boeing military products.”<sup>105</sup>

**Boeing’s major exports are to the UAE and Saudi Arabia, countries considered controversial for arms exports, both due to their role in the war in Yemen and also due to them being considered as unfree countries.**

**Boeing has exported to:**

- 
- |                |           |          |
|----------------|-----------|----------|
| → Egypt        | → UAE     | → Jordan |
| → Saudi Arabia | → Lebanon |          |
| → Turkey       | → Kuwait  |          |
- 

*i] More detail on specific exports is given in Appendix 1: Export data*

**PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:**

Boeing is contracted to help keep the Minuteman III nuclear intercontinental ballistic missiles operational in the US nuclear arsenal until 2030.<sup>106</sup> The Boeing Company is launching headfirst into the development of autonomous weapon systems stating: “Autonomy will define the next 100 years – and Boeing is driving the safe innovation and integration of autonomy to maximize human potential.”<sup>107</sup> Systems with autonomy that are being produced by Boeing include the X45 and Phantom Ray as well as the ScanEagle produced by Insitu Inc, a wholly owned subsidiary of the Boeing company. ScanEagle is a long endurance Unmanned Aircraft System (UAS) and has been in operation since 2004, it has also recently been exported to places such as Lebanon. It offers persistent surveillance and reconnaissance and is equipped with thermal imaging or a camera.<sup>108</sup>

The X-45 was developed as an UCAV prototype, which can carry advanced precision guided munitions.<sup>109</sup> The taxiing, take-off and landing are fully autonomous but a pilot-operator has the option of controlling these manoeuvres. It is equipped with a suite of sensors which allow detection, identification, and location of fixed and mobile targets in near real time.<sup>110</sup> While X-45 was not put into production, the fundamentals formed the basis for the the Phantom Ray. The Phantom Ray is a private venture, by Boeing Phantom Works, based on the X-45 data.<sup>111</sup> Further testing of the UCAV will explore its capabilities for “supporting missions that may include intelligence, surveillance, and reconnaissance; suppression of enemy air defenses; electronic attack; hunter/killer; and autonomous aerial refuelling.”<sup>112</sup> This was also not put into production.

# General Dynamics Corporation



M1A1 Abrams Tank by General Dynamics  
©Nathan Rupert

## Finance provision General Dynamics (in € millions)

BBVA	2,097.03
Lloyds Bank	2,353.91

## Investment in General Dynamics (in € millions)

Deutsche Bank	110.65
Crédit Suisse	88.70
Barclays	66.53

General Dynamics is a global aerospace and defense company, in 2017 it had operating earnings of around \$1.59 billion. It is the sixth largest defense company in the world and it earns 63% of its revenue from its defense business.<sup>113</sup>

### EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

General Dynamics has exported to Egypt, UAE and Saudi Arabia. It has exported tanks to Egypt which were delivered in 2015. Egypt has an arms embargo in place for any weapons that could be used for internal repression. Tanks and other armoured vehicles can be used by security forces to suppress protests.<sup>114</sup> Amnesty has noted that equipment, such as small arms, batons, tear gas and armoured vehicles, has been repeatedly used to repress dissent.<sup>115</sup> Exports to Egypt are exports to a conflict zone, a repressive regime and a state with an existing arms embargo.

Saudi Arabia is also currently at war in Yemen and has a repressive authoritarian regime – yet hundreds of tanks and armoured vehicles have been exported to Saudi Arabia by General Dynamics.

### EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

General Dynamics tanks have been used in the war in the Yemen and have been observed in operations, as have the LAV-25 turrets, although these were ordered before the war began – it is uncertain when the delivery of these turrets occurred. General Dynamics exported M-1A2S tanks to Kuwait and Saudi Arabia, these tanks have been used on the ground in Yemen.<sup>116</sup> The data also shows a tank delivery to Yemen, although the supplier here is uncertain.

**General Dynamics has exported weapons systems to countries which repress opposition and kill, imprison and torture political opponents.<sup>117</sup> Despite a clear arms embargo in Egypt on “any equipment which might be used for internal repression” General Dynamics exported tanks to the country. General Dynamics also exported to Saudi Arabia, another repressive regime, currently leading the coalition in Yemen.**

General Dynamics also notes: “We believe decisions about what types of weapons to buy, where to sell them and how to use them are inherently governmental responsibilities.”<sup>118</sup> Through this statement they attempt to abdicate themselves of any responsibility in the impacts of their weapons exports.

### General Dynamics has exported to:

- Egypt
- Saudi Arabia
- Yemen
- Kuwait

*i] More detail on specific exports is given in Appendix 1: Export data*

### PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:

General Dynamics produces key components for UK and US Trident II nuclear missiles, it does not produce cluster munitions.

In October 2018, General Dynamics Land Systems and AeroVironment announced a new strategic relationship. The companies agreed to integrate small tactical UAS (such as automated drones) and precision loitering missiles into armoured combat vehicles. According to AeroVironment, “This enhanced integration will ensure precise, mobile lethality with increased automation required for small drone and loitering missile systems deployment”.<sup>119</sup> The integrated system will be able to “finish targets” and has an open design that is upgradable as new technologies become available. AeroVironment developed the Switchblade loitering munition, described as a miniature intelligence and lethal platform designed to provide the warfighter with a back-packable, non-line-of-sight precision strike solution with minimal collateral effects”. According to the producer, Switchblade can be operated manually or autonomously,<sup>120</sup> and can drop devastating miniature missiles. The US Army has deployed some 4,000 Switchblades in Afghanistan. Models have also been observed in Syria and Iraq.

## Finance provision Leonardo (in € millions)

BNP Paribas	107.69
Commerzbank	107.69
Crédit Agricole	107.69

## Investment in Leonardo (in € millions)

Crédit Agricole	78.95
Banco Santander	9.24
Deutsche Bank	7.29

Leonardo is an aerospace, defence and security company with 68% of its revenue coming from defense sales.<sup>121</sup> In 2017 Leonardo's earnings were at 1.5 billion euro.<sup>122</sup> Leonardo is also a key part of the European consortium producing the Eurofighter jets, the consortium includes BAE, Airbus and Leonardo. Leonardo has faced several recent allegations of corruption in India, Panama and South Korea.<sup>123</sup> Leonardo is a member of the UN Global Compact and has integrated the Sustainable Development Goals.<sup>124</sup> Leonardo (25%) is part of the joint venture with Airbus (37.5%) and BAE Systems (37.5%) in the company MBDA, which produces missiles and missile systems.

## EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

Leonardo has exported helicopters, military satellites and maritime patrol aircraft to Turkey which were delivered variously between 2015 and 2016. Turkey joined the US-led coalition operations in Syria in 2014, the intensity level reached war in 2016. In early 2018 an offensive by Turkish military forces (operation olive branch) in northern Syria killed at least 260 Syrian Kurdish and IS fighters and displaced around 5,000 civilians.<sup>125</sup> Human Rights Watch has condemned Turkey's offensive on the Kurdish held area as causing unnecessary civilian casualties (an estimated 120).<sup>126</sup>

Leonardo has also provided exports to several countries where government corruption in defense contracts is of high concern, including Saudi Arabia, Egypt and the UAE.

Egypt is also considered to be a country at war, making it controversial for arms exports. In addition, there have been allegations of serious human rights violations including extrajudicial killings by the Egyptian military in Sinai against IS.<sup>127</sup>

**Leonardo has exported to countries at war which leaves the company at risk of being associated with human rights violations. It has also exported to countries which repress and oppress their citizens.**

Leonardo has developed its own internal export policy, which is applied over and above the requirements by the state. This takes into account "regulations as well as obligations related to embargoes, sanctions or other trade restrictions". Interestingly this policy does not list Saudi Arabia, Turkey, Egypt, or the UAE as sensitive countries for export.<sup>128</sup>

## EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

Egypt, the most populous country in the Arab world, is a member of the Saudi-led coalition at war in Yemen, its role is mostly to patrol Bab al-Mandab (the strait between Yemen and the Arabian Peninsula) with naval vessels.<sup>129</sup> Leonardo has provided naval guns for warships. It cannot be evidenced that these have been used in the war directly.

### Leonardo has exported to:

- 
- Turkey
  - Saudi Arabia
  - Egypt
  - UAE
- 

### Leonardo has, as part of the consortiums MBDA/Eurofighter, exported to:

- 
- Saudi Arabia
  - Egypt
  - UAE
  - Kuwait
- 

*i] More detail on specific exports is given in Appendix 1: Export data*

## PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:

Leonardo does not produce cluster munitions, but it is a key producer for the French nuclear weapons arsenal. Leonardo develops technologies aimed at minimising human intervention in their operations. Accordingly, the company is developing systems and platforms in various areas from underwater to space, including satellites and robotics for extra-planetary missions, land, and air (mini and tactical MALE UAV, UCAV and RUAV).<sup>130</sup>

Also through its joint projects for example with MBDA, Leonardo has a role in producing weapon systems with autonomous features.

# Lockheed Martin Corporation

## Finance provision Lockheed Martin (in € millions)

Crédit Agricole	1,235.85
Lloyds Bank	911.90
UniCredit	581.68

## Investment in Lockheed Martin (in € millions)

Barclays	190.96
Deutsche Bank	180.20
Crédit Suisse	131.69



Lockheed Martin advertising the Hellfire missile at IDEX 2019 in Abu Dhabi. © Facing Finance

Lockheed Martin is the largest aerospace and defence company in the world and 88% of its revenue is from arms sales. Lockheed Martin in 2017 earned \$2 billion after taxes and costs.<sup>131</sup>

## EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

While Lockheed notes that “careful consideration for export controls and trade policies, products’ intended use and impact on civilian needs” is undertaken before sales occur,<sup>132</sup> the company has exported to seven of the 16 controversial countries, including guided rockets to Bahrain. In Bahrain there is a very real risk that arms exports will contribute to internal repression by the state. Bahrain continues to violate its population’s human rights, and its security forces have been accused of, among other crimes, arbitrary arrest and detention, suppression of the right to free expression, assembly, and association, and the torture of detainees.<sup>133</sup> Any arms deals with the government since 2011 would be considered controversial as there is a high risk that it could be used to suppress civil liberties. Arms exports to this country negatively affect Bahrainis’ right to life, right to peaceful assembly and association, and right to free expression.

Lockheed has exported 5,000 Hellfire missiles to Iraq (a fragile state which is currently in conflict) and 150 to Lebanon, also a country in conflict due to its fight against the IS in the region.

**Lockheed has exported not only many thousands of Hellfire missiles to countries in conflict, including those engaged in the war in Yemen, but also aircrafts and helicopters. Bahrain is considered to be one of the most repressive states in the MENA region, yet this has not prevented Lockheed’s exports.**

## EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

Lockheed has exported to almost all the countries involved in the Saudi coalition, with the exception of Morocco and Sudan. Lockheed has exported F-16s and guided rockets to Bahrain. Indeed, Lockheed signed a new contract in June 2018 to provide an additional 16 F16s to Bahrain.<sup>134</sup> Patriot PAC3 missile systems have been sold to Kuwait and Saudi Arabia and have been used in the war in Yemen, however these are used to destroy incoming missiles.<sup>135</sup> →



SOM missiles on offer at Eurosatory 2016 in Paris  
© Facing Finance

Lockheed Martin is proud of its relationship with Saudi Arabia, noting “[...]. We are especially proud of how our broad portfolio of advanced global security products and technologies will enhance national security in Saudi Arabia, strengthen the cause of peace in the region”.<sup>136</sup>

**Lockheed Martin has exported to:**

- Bahrain                      → Saudi Arabia              → Kuwait
- Egypt                         → Turkey                      → Morocco
- Iraq                            → UAE
- Lebanon                      → Jordan

*i] More detail on specific exports is given in Appendix 1: Export data*

**PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:**

Lockheed Martin is heavily involved in the production of key components of nuclear arsenals including the Trident II (D5) missile upgrades (for US & UK), Minuteman III missiles (US), managing UK nuclear weapons laboratory, and several US nuclear weapons facilities. Lockheed Martin has also received a new \$879 million contract for the Minuteman III Re-entry System/Re-entry Vehicles (RS/RV) subsystem support to the value of until 2030.<sup>137</sup>

Lockheed is also fully committed to the research and development of autonomous weapon systems, even partnering with MIT for further research into autonomy and robotics.<sup>138</sup> In 2005 Lockheed demonstrated a low cost autonomous attack system which was able to gather information, as well as (with authorisation from an operator) attack specific targets.<sup>139</sup> The Low Cost Autonomous Attack System (LOCAAS) is a very good example of wide area search vehicles that are under development.<sup>140</sup> It is a loitering weapon (loitering weapons can stay in an area for an extended time to find and strike targets on the ground) with a fully autonomous engagement mode. The LOCAAS was eventually cancelled, reportedly due its high level of autonomy.<sup>141</sup> Because a fully autonomous attack mission without the option of operator intervention is undesirable in many tactical situations, Lockheed Martin added a two-way satellite link to the LOCAAS system to allow for a “man-in-the-loop”.

Lockheed has also demonstrated turning an F-16 fighter into an autonomous drone. The programme is known as “Have Raider” and is currently a demonstration programme. “Have Raider I” developed an autonomous F-16 which could leave its manned aircraft, head out and conduct an air strike then return to the manned aircraft. “Have Raider II” then built on this to allow the F-16s software to make decisions based on “operational parameters” and changing these as the situation changed.<sup>142</sup> According to Airspace Magazine this exercise shows “a drone that can detect and respond to unexpected threats on its own, with no human intervention required”.<sup>143</sup> The Have Raider II exercise carried out in 2017, showed that the F-16 drone could respond to various threats even when its data-link to the control and command aircraft on the ground was cut off.<sup>144</sup> The Have Raider exercise demonstrates that older aircraft such as the F-16 can be adapted cheaply to operate autonomously, and can work together with newer aircraft such as the F-35 in strike missions.

According to a request for Information from Flight Global Magazine: “The onboard autonomy must be sufficient for the Loyal Wingman to complete all basic flight operations untethered from a ground station and without full-time direction from the manned lead,”<sup>145</sup> this implies that the “Loyal Wingman “has to get increasingly autonomous, as the pilot in the F-16 fighter cannot command a drone (or a fleet of drones) in addition to what he is already doing.

An Unmanned Ground Vehicle (UGV), Squad Mission Support System (SMSS), was developed by Lockheed Martin and has been deployed in Afghanistan, the long-term vision for this system is to include armed direct fire and indirect fire modules.<sup>146</sup> Lockheed Martin has also developed, together with the Turkish company Roketsan, the advanced SOM-J stand-off cruise missile. This missile is capable of performing in-flight retargeting and in-flight mission selection, it is not detailed whether this is done autonomously or by a datalink with human control (as with other cruise missiles).<sup>147</sup>

# Northrop Grumman Corporation

## Finance provision General Dynamics (in € millions)

UniCredit	2,797.15
Crédit Suisse	635.22
Lloyds Bank	425.88

## Investment in Northrop Grumman (in € millions)

Deutsche Bank	118.20
Crédit Suisse	109.21
Barclays	83.65

Northrop Grumman is the fifth largest arms producing company in the world, with 87% of its revenue coming from defense sales. Its net earnings in 2017 were over \$2 billion and total sales over \$25 billion.<sup>148</sup> Northrop Grumman's largest customer is the U.S. Government,<sup>149</sup> sales to the U.S. Government accounted for 85% in 2017. Northrop Grumman has a human rights policy in which it states that it expects "partners [...] in our worldwide supply chain to share this commitment and adopt and enforce principles similar to those in our Human Rights Policy".

## EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

Exports to controversial countries are perhaps not as high as other U.S. defense companies. However Northrop has exported to Turkey, Iran and Bahrain. Northrop has exported combat aircraft radar to Bahrain, despite its poor human rights record and being considered a repressive regime- since the beginning of a government crackdown nearly a year ago, activists in Bahrain have been imprisoned or forced into exile.<sup>150</sup> Bahrain is also a member of the Saudi-led coalition in Yemen. Its purchase of the APG-83 SABR system, allows its F-16 fighter jets to be upgraded to "detect, track and identify targets faster and at longer ranges."<sup>151</sup> This aligns with the recently agreed sale of F-16s to Bahrain by Lockheed Martin.<sup>152</sup> F-16s have been used in the air campaign against Houthi rebels in Yemen.<sup>153</sup>

Combat aircraft radar were also sold to Turkey, a country defined as controversial for arms export as it is currently considered to be in armed conflict. The arms were licenced in 2009 and delivered in approx 2015. Turkey joined the US-led coalition in the war in Syria in 2014, the intensity level reached war in 2016. Arguably the exports specified in Appendix 1 are prior to Turkey's classification as a country at war.

Northrop exported to Iraq, despite it being in armed conflict since 2016, a fragile state and having a high risk of corruption in defense contracts. The arms embargo on Iraq is on non-governmental forces, therefore exports to the Iraqi government are not embargoed.

## EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

Bahrain has now upgraded its F-16 fighter jets purchased from Lockheed Martin with the combat radar system by Northrop Grumman. The delivery date is unknown but the order was placed in 2017.

Northrop shows no exports to Saudi Arabia, however they do clearly have a presence in the region noting that they: "provide a range of capabilities and technologies in defense, security, Cyber-security and communications, such as the Longbow Fire Control Radars (FCRs) for the AH-64 Apache Attack Helicopter, Northrop Grumman has been heavily involved in the training and development of the Saudi military personnel".<sup>154</sup>

Northrop Grumman notes in their corporate responsibility statement: "Doing what is right because it is the right thing to do is the foundation of Northrop Grumman's business culture. Our goal has never been solely to comply with the law, but to abide by the highest principles of integrity and concern for others. Our sense of ethics and doing what is right are the cornerstones of Northrop Grumman's exemplary reputation."<sup>155</sup>

## Northrop Grumman has exported to:

→ Bahrain → Iraq → Turkey

*i) More detail on specific exports is given in Appendix 1: Export data*

## PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:

Northrop Grumman is involved in Trident II (D5) missile upgrades (for US & UK), Minuteman III missiles (US), and involved in managing some US nuclear weapons facilities, it has also acquired Orbital ATK which has similar involvements.<sup>156</sup> →



Northrop Grumman X47-B Unmanned Aerial Vehicle. © Sarah Pierce, Flickr.  
 Provided under creative commons license CC-BY-2.0

Northrop Grumman has produced various types of systems with autonomous features for land, sea and air. Key programmes include high-altitude long-endurance systems, such as the Global Hawk system, which provides near real-time high-resolution imagery, also the Triton system, which provides real-time ISR over vast ocean and coastal regions for maritime domain awareness.

Through its purchase of Orbital ATK in September 2017,<sup>157</sup> Northrop Grumman has further enhanced its technology in the field of autonomous systems. This includes the miniature flying lethal missile made together with AeroVironment, known as Switchblade© (see also General Dynamics).<sup>158</sup>

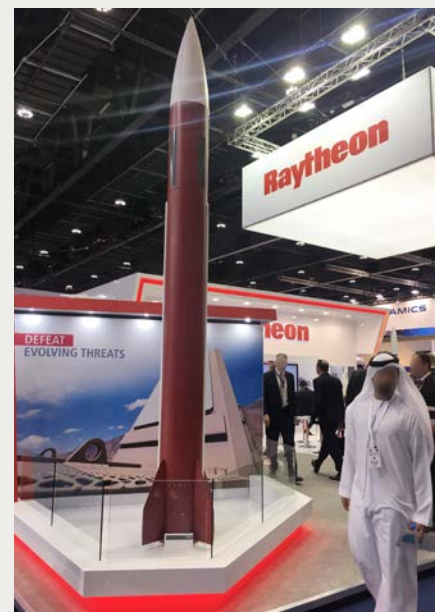
The combination of the Switchblade loitering missile with Puma UAE systems (sensor-to-shooter or S2S) was demonstrated in April 2018 by AeroVironment.<sup>159</sup> The Puma was able to “successfully locate and identify a series of fast-moving attack craft” and pass the locations to Switchblade, Switchblade then launched and automatically flew to the target and engaged the threat (in the demonstration with an inert payload). The operation to engage was confirmed by an operator. Currently fielded Switchblade systems can be upgraded with the S2S capability. This demonstration showed the ability of two systems working together with limited human intervention, except at the end stage of engaging or striking the target, to operate an entire mission autonomously.

“With future enhancements, multiple simultaneous threats can be defeated”. Future enhancements will include a multi-pack launcher that holds up to six Switchblade munitions and software that allows operators to control multiple air vehicles simultaneously.<sup>160</sup>

Northrop also produced the X-47B, an unmanned combat aerial vehicle (UCAV). This also has the potential to be armed with precision guided missiles.<sup>161</sup> The system is capable of autonomous launch and landing on the deck of an aircraft carrier.<sup>162</sup>



# Raytheon Company



Raytheon advertising their missiles at IDEX 2019 in Abu Dhabi.  
© Facing Finance

## Finance provision Raytheon (in € millions)

Barclays	57.99
BNP Paribas	57.99
Crédit Agricole	57.99

## Investment in Raytheon (in € millions)

Crédit Agricole	631.70
Deutsche Bank	418.46
Crédit Suisse	127.65

Raytheon is the third largest defense company in the world by arms sales, with 94% of its revenues coming from arms sales. Raytheon operates five business segments: Integrated Defense Systems; Intelligence, Information and Services; Missile Systems; Space and Airborne Systems; and Forcepoint. Raytheon notes that “The Middle East is one of our most important markets, with countries demanding integrated fighter aircraft systems, air and missile defense solutions, C5I™ products and services, and critical infrastructure protection and cybersecurity solutions”.<sup>163</sup> Their customers in the region include Saudi Arabia, Bahrain, Egypt, Jordan, Kuwait, Oman, Qatar, the UAE and others.

## EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

Raytheon has exported to countries in conflict, including Saudi Arabia, Turkey, Egypt, Iraq, and Bahrain. It has also exported to un-free regimes such as the UAE and Saudi Arabia.

Raytheon has exported to countries that are fragile states, those experiencing high levels of instability, poverty and conflict. It has exported to countries where there is oppression of political and civil liberties and countries in the midst of armed conflict.

**Raytheon has been by far one of the largest exporters to the Saudi-led coalition in Yemen, including thousands of Paveway missiles and thousands of anti-tank missiles to Saudi Arabia, Morocco and the UAE. This continues with new deals that Raytheon is making in the region in 2019.**<sup>164</sup>

## EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

Raytheon has exported thousands upon thousands of Paveway missiles to Saudi Arabia, the UAE and to Jordan, evidence of their use has been found in Yemen, some of these targets have also been associated with the violation of international humanitarian law (IHL), as they appeared to directly target civilian infrastructure.

13,600 Paveway missiles were sold to the UAE in 2017, arguably, after there was strong evidence provided that the Saudi-led coalition was violating IHL. Precision missiles, tanks, armoured vehicles and guided bombs have been exported by Raytheon to the Saudi-led coalition members and have unequivocally been instrumental in the death and destruction in Yemen. In May 2017, Raytheon Company and SAMI (Saudi Arabia Military Industries) agreed to cooperate on defense-related projects to create indigenous defense, aerospace and security capabilities in the Kingdom.<sup>165</sup>

### Raytheon has exported to:

→ Bahrain	→ Saudi Arabia	→ Jordan
→ Egypt	→ Turkey	→ Morocco
→ Iraq	→ UAE	
→ Lebanon	→ Kuwait	

*ij More detail on specific exports is given in Appendix 1: Export data*

## PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:

Raytheon is involved in the Minuteman III missile system for the US nuclear arsenal. It is also producing key components for the new US Long Range Standoff weapon. Raytheon is therefore considered to be involved in the production and facilitation of nuclear weapons – despite its slogan “Creating a Safe World”.<sup>166</sup> →



Unmanned autonomous vessel shown at UMEX exhibition in Abu Dhabi 2016, © Facing Finance

Raytheon also takes a proactive and positive stance towards the development of autonomous weapons systems, with limited acknowledgement on their website about the moral or ethical implications this may bring. One of the advanced systems it is working on is the anti-ship or land-attack Joint Strike Missile or JSM which it is developing with Kongsberg. This missile uses advanced seeker and target-identification technology, with automatic target recognition, and can strike targets over 100 nautical miles away.<sup>167</sup> It was developed for the F-35 fighter jet and initial tests are being completed on the F-16. The JSM can be air launched or ship launched.<sup>168</sup> The weapon has a large database of ship types which mean that it can distinguish between these and the intended target.<sup>169</sup> The missile would therefore be able to differentiate between, for example a destroyer and an aircraft carrier, zeroing in on the larger ship.



Joint Strike Missile or JSM presented at DSEI 2015 © Facing Finance

Raytheon, as with other defense companies is also developing tools to autonomously control swarms of ground and air-based drones.<sup>170</sup> The Coyote Unmanned Aerial System (UAS) is defined as having “a breakthrough technology that uses information sharing between UAVs, which enables autonomous, collaborative behaviour.” It is being used by the US military to attack enemy UAVs.<sup>171</sup>

Raytheon is also involved in the development of marine autonomous vessels and is described as a key player in the autonomous navigation market along with Thales (France) and Northrop Grumman (US) among others.<sup>172</sup> Finally, Raytheon sponsors the Center for Autonomous Systems and Technology advancing the science of bio-inspired systems and autonomous technologies. The research apparently aims to improve the working relationship between robots and the human operators that control them.<sup>173</sup>

# Rheinmetall Group

## Investment in Rheinmetall (in € millions)

Crédit Agricole	92.53
Deutsche Bank	26.81
Crédit Suisse	11.83

## Finance provision Rheinmetall (in € millions)

Commerzbank	227.25
-------------	--------



Rheinmetall Munitions displayed at booth from Saudi-Arabian weapon producer MIC at IDEX 2013, © Facing Finance

Rheinmetall is the largest German arms producer, ranking 25th on the global list of defense companies in 2017. 51% of its total sales are in arms and in 2017 they had sales of € 5,896 million of which € 3,036 million was from their defense sector.<sup>174</sup>

## EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

Rheinmetall has exported Armoured Personnel Carriers to Egypt as part of a long term agreement since 1987 where the last of these were delivered in 2015. Germany has been increasing its exports to Egypt as the US reassess their involvement.<sup>175</sup> Egypt is considered to be a repressive state which crushes civil dissent, often violently, and arms such as tanks are particularly controversial as they can be used to oppress civilians – in addition these types of large arms have been covered by an arms embargo since 2013.

## EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

In November 2018 Germany halted arms exports due to Saudi involvement in the killing of Jamal Khashoggi. Rheinmetall responded to this in January 2019 by threatening to sue the German government for loss of revenue due to the halt in arms transfers, a clear indication that human rights concerns are not top of their agenda. This chimes in contrast to Rheinmetall's export policy which notes: "the manufacture, trading and export of defense technology products is strictly regulated, particularly in our home market of Germany, and rightly so".<sup>176</sup>

In 2016 Rheinmetall delivered air search radars to Saudi Arabia, through their subsidiaries and partners Rheinmetall also export to countries within the Saudi-led alliance. Rheinmetall, through their subsidiary Rheinmetall Denel Munitions, have set up a \$240 million projectiles factory in Riyadh, which produces artillery shells, mortar projectiles and aircraft bombs up to 2000lb.<sup>177</sup> Naturally these will not be subject to export restrictions.

Further joint ventures of Rheinmetall include RWM-Italia, which has also exported to the Saudi coalition and the use of these weapons were linked to the death of civilians – this was a well-documented aerial bombing that killed six family members, including four children. A coalition of human rights groups are now suing the Italian foreign ministry and Rheinmetall over this.<sup>178</sup>

Additionally, Rheinmetall has exported to other countries involved in the war in Yemen delivered in 2016 and 2017, such as recent exports to Kuwait, which includes a technical support agreement covering a period of five years.<sup>179</sup> Pietro Borgo, Managing Director of Rheinmetall MAN Military Vehicles and Member of the Executive Board of Rheinmetall Defence, explains in relation to the Kuwait deal, "This important order is a major vote of confidence by an Arab country in Rheinmetall, Europe's leading supplier of army technology. We greatly appreciate this. By placing this order, Kuwait will soon possess NBC reconnaissance capabilities that are second to none. We are very pleased to be making a decisive contribution here".\* →

\* Rheinmetall AG (2.7.15): Kuwait Orders Advanced Armored NBC Reconnaissance Vehicles. Defense Talk. (Accessed 14.3.19) <https://www.defencetalk.com/kuwait-orders-advanced-armored-nbc-reconnaissance-vehicles-64772/>



Multi-Mission Unmanned Ground vehicle (UGV) at DSEI 2017, © Facing Finance

### Rheinmetall has exported to:

- Egypt                      → Saudi Arabia              → Saudi Arabia
- Kuwait                      → Egypt

*i] More detail on specific exports is given in Appendix 1: Export data*

### PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:

Rheinmetall does not manufacture or produce cluster munitions, nor nuclear weapons or key components thereof.<sup>180</sup> Rheinmetall does research, develop and produce weapon systems with autonomous features. This includes the SMArt 155 produced by GIWS, a joint venture of Diehl Defence GmbH and Rheinmetall Weapon Munition GmbH, as well as the Multi-Mission Unmanned Ground vehicle (MM UGV).

GIWS describes the SMArt 155 as a sensor fused munition with robust “fire and forget” capabilities which has two autonomous, intelligent and high performance submunitions.<sup>181</sup> SMArt was first deployed by the Bundeswehr in 2000, and has been sold to the armies of Switzerland, Greece, Australia and the UK.<sup>182</sup> While the SMArt 155 is not a new weapon system, it is considered to be semi-autonomous. Most fire and forget weapons pose the problem of autonomous navigation, mobility, trigger and to some extent targeting, however the target is at some point currently preselected by a human. The question here is the slide toward increasing autonomy.<sup>183</sup>

Rheinmetall’s MM UGV is a flexible and adaptable unmanned ground system which can carry out a variety of missions, including reconnaissance and surveillance. According to Jane’s it can also integrate a number of weapons, including potentially a remote weapon station fitted with seven Thales TDA rockets.<sup>184</sup> Reportedly remote control and autonomous operations are both possible.<sup>185</sup> The MM can operate in “follow-me” mode.\*\* According to news reports, Rheinmetall Canada is seeking to evolve the MM by “increasing its autonomous capability and the capacity to operate in swarms of UGVs conducting the same mission.”<sup>186</sup> The force protection variant of the MM UGV is specifically designed for perimeter protection, escorting, target acquisition, and engagement tasks.<sup>187</sup> It is seemingly unclear as to what “force protection” means in this context and what engagement tasks are covered by this term. According to a Rheinmetall press release in 2017, the UGV can be customised according to the requirements of the client.<sup>188</sup> It is of course possible that any engagement tasks could have decreasing human control in the future.

In 2018 Rheinmetall Defence Australia signed a five-year strategic research and development alliance agreement with Defence Science and Technology to commonly develop autonomous vehicle systems in Australia.<sup>189</sup> The programme will involve existing weapons systems such as the BOXER tank, which was developed by Rheinmetall for the German Army.<sup>190</sup>

\* The robot can track and follow an operator, vehicle, or another robot. Using Ultra wideband technology, the robot can understand where its target is, and keep pace at a predefined distance from the target, with options for obstacle detection.

## Finance provision Thales (in € millions)

Crédit Agricole	922.68
Banco Santander	824.75
Barclays	100.32

## Investment in Thales (in € millions)

BNP Paribas	162.59
Crédit Agricole	140.69
Deutsche Bank	51.08

two gunboats and two destroyers, both MK-class ships have Thales sting gun fire control and Scout surface search.<sup>196</sup> Thales also provides defence related land, sea and air solutions to the UAE armed forces, including on-board electronic systems for the Mirage 2000-9, Crotale MK3, GATR, PR4G F@stnet and Sonar suite.<sup>197</sup>

## Thales has exported to:

→ Egypt	→ UAE	→ Morocco
→ Saudi Arabia	→ Kuwait	
→ Turkey	→ Jordan	

*ij More detail on specific exports is given in Appendix 1: Export data*

## PRODUCTION OF CONTROVERSIAL WEAPON SYSTEMS:

Thales is involved in the M51 missile for the French Arsenal. Thales, together with Airbus, Safran, SNPE and DCNS, obtained a ten-year contract in December 2004 to build the new M51 nuclear missile for the new French submarines, with an estimated value of € 3 billion.<sup>198</sup>

France's government has announced plans to increase spending to an annual € 100 million on artificial intelligence (AI) as part of an innovation drive to develop future weapon systems. This includes the government-backed Man-Machine Teaming, or MMT, study for applying AI to combat aircraft. Dassault Aviation and Thales will lead this programme, which will draw on a network of small and medium companies and laboratories.<sup>199</sup>

Thales claims to be Europe's no 1 in unmanned aerial systems.<sup>200</sup> In 2015 Thales launched the Watchkeeper X, an unmanned aircraft system with the ability "to offer cameras, radar, electronic surveillance and a fully integrated simultaneous operation". It was designed for the British army and is based on the Elbit systems Hermes UAV. The Watchkeeper is built in the UK by UAV Tactical Systems, a joint venture by Thales and Elbit. According to news sources, the UAV has "fully autonomous mission control and an autonomous take-off and landing system, in addition to a modular design intended to future proof the craft and allow it to be adjustable to different operational requirements".<sup>201</sup> This includes the ability for the Watchkeeper X to be weaponized with the Thales Free fall light multirole missile, it can also be equipped with the STANAG standard weapon control system.<sup>202</sup>

The primary restriction that need to be placed on the development of autonomous weapon systems are that of identification, selection and application of force to targets.

Thales UK recently started to develop maritime autonomous systems in Plymouth. Thales' autonomous marine systems, including UAVs and Halcyon – an autonomous boat – were already tested by the Royal Navy.<sup>203</sup>

Thales Group is ranked ninth in the world in terms of defense sales, and the largest defense company in France. 51% of its sales came from its defense sector with € 17.7 billion in sales in 2017.<sup>191</sup> Defense related projects account for roughly 60% of Thales's overall activities in the Middle East.<sup>192</sup>

## EXPORTS TO CONTROVERSIAL COUNTRIES IN THE MIDDLE EAST AND NORTH AFRICA (MENA REGION):

Thales has exported a large number of weapons to Egypt, which since August 2013 has had an arms embargo imposed by the EU on "export to Egypt of any equipment which might be used for internal repression". It has been documented by Amnesty International that Thales has exported satellites used for crowd control.<sup>193</sup> "In so doing, they have all participated in the construction of a widespread surveillance and crowd control architecture aimed at preventing all dissent and social movement and leading to the arrest of tens of thousands of opponents and activists."<sup>194</sup> Thales notes that the Group's vision in Egypt "is to bring security, safety and growth in the country".<sup>195</sup>

**Thales has exported to Egypt and Turkey, both countries currently in armed conflict. It has also exported to countries in the Saudi-led coalition operating in Yemen.**

## EXPORTS TO COUNTRIES IN SAUDI-LED COALITION IN YEMEN:

Thales has exported to various members of the Saudi-led coalition, including Saudi Arabia, the UAE, Egypt, Kuwait, and Jordan. Its primary exports to these countries are radars, both ground and air. Egypt has also acquired frigates and radar systems from Thales since 2015. According to media reports, the Egyptian Navy has since March 2015 engaged in shelling Yemeni targets and participating in the naval blockade in the Gulf of Aden. Egypt has deployed at least

# ThyssenKrupp AG

## Finance provision ThyssenKrupp (in € millions)

Commerzbank	740.54
BNP Paribas	700.74
Banco Santander	280.72

## Investment in ThyssenKrupp (in € millions)

Deutsche Bank	107.19
Crédit Agricole	64.42
BNP Paribas	43.83



ThyssenKrupp offering marines systems in Abu Dhabi at IDEX 2019  
© Facing Finance

ThyssenKrupp is the second largest German arms company, after Rheinmetall. Only 4% of the total sales of ThyssenKrupp AG come from the defense sector,<sup>204</sup> this is predominantly through ThyssenKrupp Marine Systems which produces submarines and undertakes naval services.<sup>205</sup> ThyssenKrupp bought Atlas Elektronik in 2017.<sup>206</sup>

ThyssenKrupp has exported submarines to Egypt which were delivered between 2016 and 2017 and a further order is yet to be delivered. In the last five years German exports to Egypt have increased 205%.<sup>207</sup> The submarine deal between ThyssenKrupp and Egypt has a large part to play, but also Diehl Defense and Krauss Maffei Wegmann have exported to Egypt.<sup>208</sup>

Egypt is noted here as it is controversial for arms exports, due to being in armed conflict, participating in the Saudi-led coalition in the war in Yemen, and having a repressive authoritarian regime.

Information on ThyssenKrupp's submarines delivered to Israel can be found in the feature article on Israel in this report.

### ThyssenKrupp has exported to:

→ Egypt

*i] More detail on specific exports is given in Appendix 1: Export data*

# Features



Launching a Multiple Launch Rocket System (MLRS).

© US Army via Flickr CC-BY-2.0

# Arms companies exporting to Israel: complicit in the support of collective punishment and restriction of movement of Palestinians, and violations of international law

## Background to the conflict:

The conflict between Israel and Palestine has been ongoing for over 70 years, and in the years 1989 to 2017 resulted in over 6,362 deaths.<sup>209</sup> In recent years the primary conflict has involved Israel and Hamas.<sup>210</sup> As recently as March 2019 the conflict escalated with two rockets being fired from Gaza toward the metropolitan region of Tel Aviv.<sup>211</sup> In an immediate response the Israeli army undertook airstrikes on up to 100 targets in Gaza. Media in Gaza also declared that Israeli naval vessels were involved in strikes off the coast of Rafah.<sup>212</sup>

Since early 2000, four major conflicts involving Palestine and Israel have taken place; from 2000–2005 the second intifada started in Palestine, thereafter the 2008–2009 “operation cast lead”, 2012 “operation pillar of defence” and 2014 “operation protective edge” followed.<sup>213</sup> Israel is also involved in conflicts with Syria and with groups in southern Lebanon<sup>214</sup>.

## Human rights violations and contradiction to humanitarian law:

During the conflicts in 2008, 2012 and 2014 the Israeli army killed over 2,000 Palestinian civilians.<sup>215</sup> Undoubtedly, on the other hand, the Palestinian organization Hamas also violates international law, for example by using the presence of civilians to cover its military actions against Israel.

One way in which Israel is violating the human rights of Palestinians, is through the Gaza blockade, which has been imposed by Israel (and Egypt) since 2007, it restricts the movement of around 2 million Palestinians, and has left more than 1 million Palestinians dependent on humanitarian aid. According to the UN, “The Gaza blockade (through the land, air and sea) is a denial of basic human rights in contravention of international law and amounts to collective punishment. It severely restricts imports and exports, as well as the movement of people in and out of Gaza, and access to agricultural land and fishing waters”<sup>216</sup>. This blockade has led people to take to the streets in demonstration.<sup>217</sup>

**Israel’s occupation policies continue to violate the human rights of Palestinians, yet defense companies including Boeing, Lockheed Martin, Raytheon and ThyssenKrupp continue weapons exports to Israel.**

Israeli forces used lethal force against Palestinian protestors around the Gaza frontier in March 2018. Israeli forces shot with live ammunition against protestors, despite no imminent threat to life of Israeli soldiers or Israeli civilians. These actions were taken on the basis of a policy to use live ammunition against people who approached or attempted to damage the fences.<sup>218</sup> A UN investigation concluded these were “serious violations of human rights and international humanitarian law,”<sup>219</sup>. It concluded the demonstrations were almost entirely civilian in nature and the use of lethal force against the protestors was neither necessary nor proportionate. In this regard Israel has been accused of war crimes<sup>220</sup> and human rights violations in their use of weaponized force.<sup>221</sup>

The Israeli government enforces severe and discriminatory restrictions on Palestinians’ human rights – both through the restriction of movement in and out of the Gaza strip but also through the unlawful transfer of Israeli citizens to the west bank where Israeli authorities have evicted hundreds of Palestinians from their homes. Israel has enforced military checkpoints and firing zones within the West Bank.<sup>222</sup> Consequently, NGOs such as Amnesty International are demanding an arms embargo on Israel as well as Palestinian armed groups.<sup>223</sup>



Armored Corps Operate Near the Gaza Border  
© Israel Defense Force





**Israeli Made Guardium UGV:** This Israeli made unmanned ground vehicle is one of Israel's most important weapons on its border with Gaza. Photo of a display/poster at Eurosatory 2018. © Facing Finance

### Arms Companies delivering to Israel:

Israel has a technologically advanced local weapons industry, which is considered a strategically important sector. Israel ranks 8th in the world in terms of its arms exports, but also 8th in the world in relation to its import of arms.<sup>224</sup> In the last four years Israel has imported weapons from several companies including Boeing, Leonardo, Lockheed Martin, Raytheon and ThyssenKrupp.

In the 2008/09 war it is claimed that Israel used the GBU 39 from Boeing to destroy infrastructure in Gaza.<sup>225</sup> This same type of weapon has been sold to Israel by Boeing in the period 2014–2017, there is of course the risk that these weapons will again be used to inflict severe damage on Palestinian people and infrastructure. The German company ThyssenKrupp has also made deliveries to Israel, the company delivered vessels including submarines and a frigate to the military forces of Israel over the period 2012–2017. The conflict between Palestine and Israel is not confined to land, and naval vessels have in the past been involved in attacks on Gaza,<sup>226</sup> was also a report of an attack against civilian fisherman.<sup>227</sup> While naturally it cannot be said that ThyssenKrupp is, through its deliveries of vessels, directly involved in any incidents of human rights violations, it shows the volatile situation on the coastline and the potential for violations in this area. Naval vessels are also used by Israel to protect the gas fields in the offshore region, some of these gasfields were confiscated by Israel during “operation cast lead”.<sup>228</sup>

### Autonomous weapons patrolling the border:

With a well-developed defence sector, Israeli defence companies also produce a number of autonomous weapon systems.<sup>229</sup> One of these systems has been used to patrol the Gaza border, it is called the Guardium, produced by the Israeli company G-Nius. It can be used in different modes, either remote controlled or pre-programmed, and can be equipped with or without a remote-controlled light weapon system.<sup>230</sup> Its task is to protect the Gaza border and to keep in check invaders until the soldiers are able to reach the spot. The army will also deploy a new unmanned patrol vehicle that can carry remote controlled weapons and sensors to patrol the Gaza border. Soldiers will control all of the vehicles in the same operation room, which can be located long distances from the border area. “It’s possible to guide the vehicle to all sorts of places without operation rooms nearby.”<sup>231</sup> The Guardium system was also evaluated for use in securing the perimeter of the Ben-Gurion international airport.<sup>232</sup>

### OTHER AUTONOMOUS WEAPON SYSTEMS DEVELOPED BY ISRAEL

In addition to systems such as the Guardium, Israel has well developed loitering drones, for example the Harpy drone is described by its manufacturer Israel Aerospace Industries as a “Fire and Forget” autonomous weapon, which “detects, attacks and destroys enemy radar emitters”.<sup>233</sup> It is a loitering munition that once launched searches for enemy radar signals and engages detected targets without human approval. The system can stay in the air for several hours and cover around 500 km. Paul Scharre captures it in a nutshell: “The human launching the Harpy decides to destroy *any* enemy radars within a general area in space and time, but the Harpy itself chooses the specific radar it destroys.”<sup>234</sup> However, the Harpy drone cannot tell if the detected enemy radar signal is indeed a military target or rather on a civilian building, such as a school or hospital. It clearly fails the principle of distinction required by international humanitarian law.<sup>235</sup>

Exporting weapons to a state where human rights are violated and weapons are used to oppress civilians is considered highly controversial and should be closely monitored by companies. The companies exporting to Israel must ensure that due diligence is undertaken to ensure that their weapons will not be associated with the violation of human rights and in Israel this risk remains high. In addition, Israel’s development of autonomous weapon systems should be closely monitored to prevent the development of fully autonomous weapons systems, the technology is developing rapidly toward increasing autonomy and these systems would not meet the standards of international humanitarian law.

# Companies exporting to countries in the Saudi-led Alliance at war in Yemen



# Hand-in-Hand: Banks and Arms companies profiting from war (crimes) in Yemen

## **B**ackground to the war: Countries involved in the ongoing conflict in Yemen

The conflict in Yemen escalated heavily in 2015, when the Saudi-led coalition began air-strikes in the region. The coalition, fighting the Houthi forces, consists of Saudi Arabia, Bahrain, Kuwait, the United Arab Emirates (UAE), Egypt, Jordan, Morocco, and Sudan.<sup>236</sup> Although initially part of the coalition, Qatar withdrew in 2017 following the breakdown in relations with UAE and Saudi Arabia.

Coalition countries are involved to varying degrees, with Saudi Arabia leading the coalition and conducting the majority of air-strikes, the UAE, congruous to its Saudi partners, participates in air warfare but also holds a key role on the ground in southern Yemen. The UAE sponsors, trains and arms its allied Yemeni forces and has also established detention centres (believed to have violated human rights including, but not limited to, torture of its inmates). Sudan has the largest military presence on the ground in Yemen of any external member of the coalition. Egypt has played a role in the air campaign as well as sending 800 ground troops to Yemen and contributed to the naval blockade with four warships.<sup>237</sup> The coalition members refuse to provide any detail about specific incidents regarding their role in alleged unlawful air-strikes.<sup>238</sup>

### **Evidence of War crimes: HUMAN RIGHTS IMPACTED**

Arms transfers to the Saudi Arabia-led coalition negatively impact the enjoyment of human rights. The substantial flow of weapon systems to countries involved is fuelling a devastating war. HRW and other international and Yemeni groups have, since early in 2016, called for foreign governments to halt sales and transfers of all weapons and military related equipment if “there is a substantial risk of these arms being used to commit or facilitate serious violations of international humanitarian law or international rights of law”.<sup>239</sup> There is strong evidence that IHL has been violated. This would mean that exports to the Saudi Alliance also violate the core norms of the Arms Trade Treaty (ATT).

A Group of Regional and International Eminent Experts on Yemen, appointed by the UN, concluded in a report published in August 2018, that the coalition (among other entities), including Saudi Arabia and the United Arab Emirates, have committed acts that may, subject to determination by an independent and competent court, amount to international war crimes.<sup>240</sup> The report notes that in certain cases detailed over the period 2014 – June 2018, evidence strongly demonstrates that the Saudi Arabia-led coalition violated IHL principles, including those relating to distinction, proportionality, and precautions in attack that may amount to war crimes.

The coalition blockades and restrictions on naval and air entries, can be seen as potential violations of IHL.<sup>241</sup> 80% of Yemen’s food is imported, meaning the blockade has accounted for nearly 2 million children in Yemen suffering from severe acute undernourishment, 400,000 of which are very close to starving to death. More than 2,200 people have died of Cholera and already malnourished children are weakened in their fight against Cholera as well as Diphtheria. Cholera is easy to treat, however, 50% of hospitals have been destroyed and there continues to be a lack of doctors and medication, also attributable to the blockade.<sup>242</sup> Save The Children estimates that 130 children under the age of five die every day due to preventable causes. Currently, there is no child in Yemen not in need of humanitarian aid.<sup>243</sup>



The UK backed Saudi assault on Yemen targeting schools, hospitals, markets ...  
© Alisdare Hickson

The coalition airstrikes have caused the most direct civilian casualties, with airstrike hits on residential areas, markets, funerals, weddings, detention facilities, civilian boats, and medical facilities. This brings into question compliance with one of the most fundamental principles of the laws of war – the distinction between civilian objects and military objectives. Attacks may only be directed at combatants and military objectives.<sup>47</sup> The group of independent experts examined many of these cases, concluding that attacks may have been in violation of the principles of distinction, proportionality and precaution and may amount to war crimes. The head of the Expert panel noted: “There is little evidence of any attempt by parties to the conflict to minimize civilian casualties.”<sup>244</sup>

**American- and British-made bombs may have killed or injured nearly 1,000 civilians, including children, in twenty-seven attacks in Yemen’s four-year conflict.**<sup>245</sup>

**Evidence of weapons used in specific attacks and potential war crimes in Yemen:**<sup>246</sup>

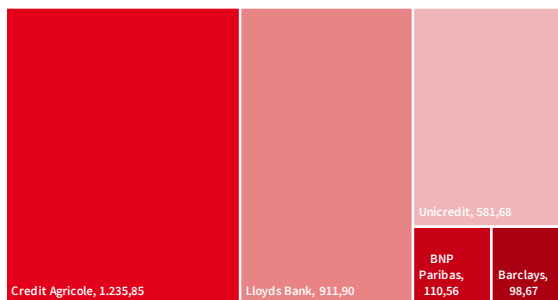
Since the war began in 2015, neither the US nor the UK has reduced arms sales to the Saudi Alliance, for example in November 2015 the US agreed a deal to provide 10,000 (with the value of 1.29 billion USD) advanced air to ground munitions to the Saudi forces for operations in Yemen and Syria.<sup>247</sup> These munitions included Paveway munitions made by Lockheed and Raytheon.<sup>248</sup>

**LOCKHEED MARTIN**

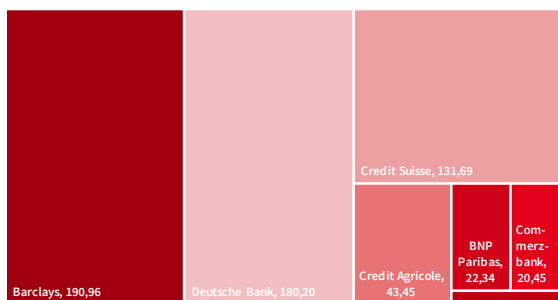
The bus attack of the 9th of August 2018 that killed 40 children and eleven adults, injuring a further 79 people (56 of whom were children) used the 500-pound laser-guided MK 82 bomb manufactured by Lockheed Martin. This was one of many thousand of its kind to be sold by the US to Saudi Arabia.<sup>249</sup>

In June 2016 an OECD complaint was filed against both Lockheed Martin and Boeing, alleging that the companies did not take appropriate steps to make sure their products did not cause or contribute to human rights violations and that the companies' products directly caused adverse human rights violations in Yemen, through their use by Saudi Arabia. It also claimed "that the Companies did not have a relevant human rights policy and did not carry out appropriate human rights due diligence in the sale of their products."<sup>250</sup>

Financings to Lockheed Martin



Investments in Lockheed Martin



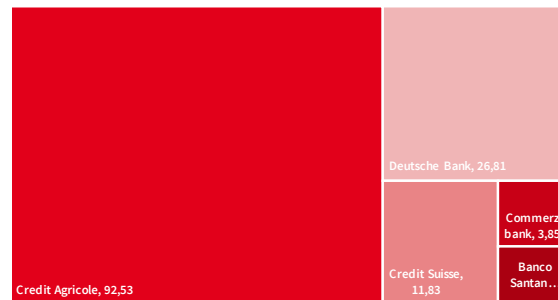
Note: all financings are for the period Nov 2015–Jan 2019 and investments re as at 15.01.2019. All figures are given in € millions.

**RHEINMETALL**

On the 8<sup>th</sup> of October 2016 an airstrike hit the village of Deir Al-Hajari, killing a family of 6. The missile used was a guided bomb in the MK-80 family of ammunitions. In the rubble with the remnants of the bomb, was a suspension lug used to attach the weapon to the plane. The serial marks on this part of the weaponry shows it was manufactured by RWM Italia, a subsidiary of Rheinmetall, a German arms manufacturer.<sup>251</sup> A criminal complaint has been filed alleging criminal responsibility of the Rheinmetall subsidiary and the Italian export authorities.

Only Commerzbank provided financings to Rheinmetall, in the region of €200 million in November 2015.

Investments in Rheinmetall



Note: all financings are for the period Nov 2015–Jan 2019 and investments are as at 15.01.2019. All figures are given in € millions.

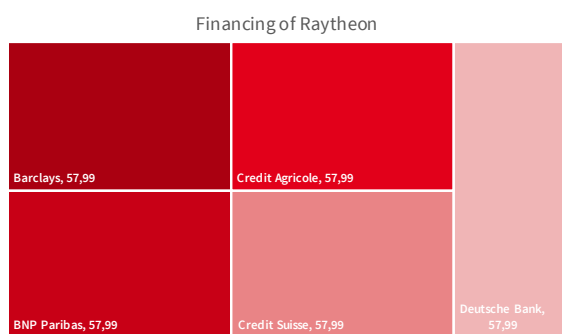
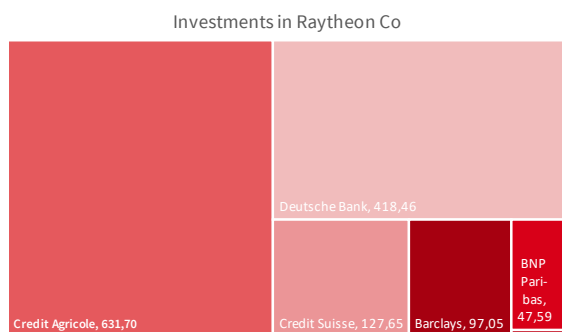
**RAYTHEON**

Paveway IV. This missile was co-developed by the British and US branches of Raytheon, with Saudi Arabia being the only customer for the high precision, 500-pound bomb (aside from the RAF). The Paveway is used on the Typhoon and Tornado strike aircraft, manufactured by BAE. A number of the components for the bomb are supplied by Thales UK and Raytheon UK.<sup>252</sup>

A 2016 report by HRW presented clear and compelling evidence that UK arms, including the Paveway missile, have been used to indiscriminately target 13 civilian economic structures in 17 raids by the Saudi-led coalition, including food warehouses and a soft drinks factory.<sup>253</sup> HRW reported 130 civilian casualties with a further 171 injured in the attacks. One of the Paveway IV guided bombs was produced in May 2015, meaning it was sent to Saudi Arabia after the coalition had commenced aerial campaigns in Yemen.<sup>254</sup> On the 5<sup>th</sup> of August 2016, a Paveway guided missile hit a Médecins Sans Frontières hospital, killing 11 and injuring 19 others. In the final report of the UN Panel of Experts Yemen, for the UN Security Council, published in January 2018,<sup>255</sup> evidence of Paveway systems used by the Saudi coalition on civilian targets was

shown for nine airstrikes, resulting in a civilian death count of 84. The fact, among others, that these are precision guided missiles indicated to the UN Experts that in the majority of cases it is highly unlikely that the principles of IHL of proportionality and precaution in attack were respected. This report sets a very high threshold for credibility and is based on verifiable information only.

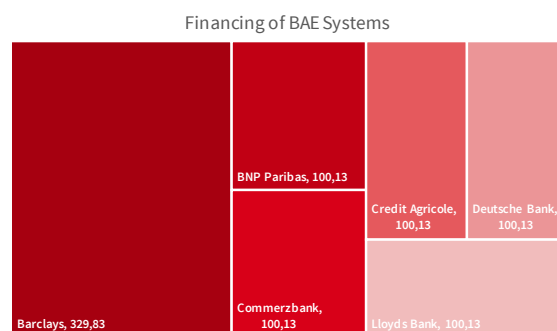
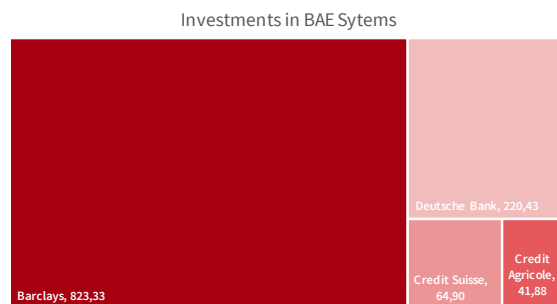
The extent to which Raytheon is involved in Saudi Arabia is also demonstrated by the fact that in 2017 they set up a wholly owned subsidiary there, Raytheon Saudi Arabia.<sup>256</sup> By setting up here Raytheon is able to circumvent any oversight offered by state arms export controls in the US and thereby circumventing the Arms Trade Treaty.



Note: all financings are for the period Nov 2015–Jan 2019 and investments are as at 15.01.2019. All figures are given in € millions.

## BAE

British Tornado and Typhoon aircraft are a major component of the Saudi Air Force, active in Yemen.<sup>257</sup> The Typhoon fighter jets used for the Paveway systems are manufactured by the British company BAE systems.<sup>258</sup> Saudi Arabia is BAE systems' largest customer representing 21% of sales.<sup>259</sup> In 2017 a court case against BAE claimed that arms sales to Saudi Arabia should be banned due to violations of human rights.<sup>260</sup> This case was thrown out of court based on the fact that despite "worrying levels of civilian casualties" the court could not determine whether these civilians were being deliberately targeted.<sup>261</sup>



Note: all financings are for the period Nov 2015–Jan 2019 and investments are as at 15.01.2019. All figures are given in € millions.

## MBDA

HRW identified in their report a UK- manufactured PGM- 500 "Hakim" air-launched cruise missile which was used to target a civilian ceramics factory in Yemen, this was manufactured by the firm Marconi dynamics in 1990.<sup>262</sup> Marconi Dynamics eventually became part of MBDA, however the missile was of course manufactured and sold long before MBDA had any involvement.<sup>263</sup> The UK parliament has also confirmed that MBDA weapons have been used in Yemen including; Dual Mode Brimstone, ALARM anti-radiation missile, Storm Shadow long-range cruise missile.<sup>264</sup> In December 2016, Sky news reported that a nose cone of a storm shadow missile had been found on the ground in Sa'adah City in Yemen.<sup>265</sup>

Many of the case examples of specific weapons found, have been implicated in the death of civilians and often directly in potential violations of IHL. The clear-cut case for increased scrutiny of exports to the regions.

MBDA is a private company owned by Airbus (37.5%), Leonardo (25%), and BAE Systems (37.5%).



Remnant of a Paveway IV Guided bomb that struck the Hodeida Warehouses. The stock number indicates that Raytheon manufactured the bomb in 2015, after the start of the war. © Priyanka Motaparthy. Human Rights Watch

### Exports to the Saudi Alliance:

Despite increasing ongoing evidence of war crimes, countries and companies continue arms sales to countries involved. According to SIPRI data, together the US and the UK supplied over 98 per cent of weapons imported by Saudi Arabia. Germany has made significant deliveries to Egypt and has licensed significant quantities of military equipment to Saudi Arabia (including naval patrol craft), Egypt, the UAE, and Kuwait.<sup>266</sup>

Under Article 6.3 of the Arms Trade Treaty states cannot allow arms transfers that would likely be used to commit crimes against humanity or war crimes, including attacks on civilians or civilian objects.<sup>267</sup> This means that they cannot permit arms transfers which would likely be used to violate international humanitarian law.<sup>268</sup>

While companies will argue that it is the responsibility of States to approve exports in line with the ATT, the UN Guiding Principles leave no doubt that the corporate responsibility to respect human rights “exists over and above compliance with national laws and regulations”. It also articulates clearly that “responsibility to respect human rights exists independently of States’ abilities and/or willingness to fulfil their own human rights obligations, and does not diminish those obligations”. This means that although states such as the US and UK are failing to take action to prevent arms exports despite increasing evidence of violations, companies operating in these countries such as Raytheon, Lockheed, MBDA and BAE should.<sup>269</sup> These exports are in clear violation of human rights principles.

### The responsibility of Banks to respect Human Rights:

The responsibility to respect human rights is given by the UNGPs on Business and Human Rights, and within this the requirement that most often applies to the relationship banks have with clients, is that businesses must “seek to prevent or mitigate adverse human rights impacts that are directly linked to their operations, products or services by their business relationships, even if they have not contributed to those impacts.” A bank can be seen to be facilitating harm where if it should have known that there is a human rights risk associated with a particular client or project but it omits to take any action to require, encourage or support the client to prevent or mitigate these risks.<sup>270</sup>

In the case of arms industry, it can be assumed that banks know well the human rights and international humanitarian law risks associated with its business model. In addition, banks should be all too aware of the risk associated with arms companies exporting to a war zone such as Yemen. Banks should therefore seek extra assurances that they are not in this way being associated with human rights violations. For example, before Barclays, Deutsche Bank, Commerzbank and others provided loans totalling over €2 billion to BAE Systems in April 2018 when information about human rights violations in Yemen were well known, these banks should have requested extra assurances regarding the arms companies’ exports. This is true also for loans provided by Lloyds Bank, Crédit Agricole and BNP Paribas to Lockheed Martin in 2018.

In response to our request only 2 banks replied, both noted that they do not disclose this information, but that they do engage with clients and that they do ensure these types of cases are reviewed at a high-level.



Destroyed house in the south of Sanaa, 13 June 2016  
Credit: Ibrahem Qasim / License: CC-BY-SA-4.0

# The bottom line: Why Autonomous Weapons are a bad investment

Autonomous weapon systems (AWS), which select and engage targets without meaningful human control, threaten to become the third revolution in warfare after the invention of gunpowder and nuclear arms. While states at the UN Convention on Conventional Weapon Systems (CCW) are trapped in years of unproductive diplomatic discussions, the development of autonomous weapons proceeds at great pace, threatening peace and stability, undermining international humanitarian law (IHL) and human rights law (IHRL), putting civilians at risk, and disputing established norms, values and principles.

## CONCERNS AND RISKS RELATED TO AUTONOMOUS WEAPON SYSTEMS

Autonomous weapons raise a number of ethical, legal, technical, operational and security policy risks:

### Ethical Risks

Giving weapon systems the freedom to select and engage targets without meaningful human control crosses a moral line. Human soldiers making life-or-death decisions incorporate – among others – human experience, emotions, ethical and legal awareness and moral judgement in decision-making processes. As moral agents they innately respect the personhood of the enemy, are aware of harming and feel the weight of this act. Outsourcing this decision to an autonomous weapon and reducing it to a few lines of code disrespects the value of life and removes the final instance of control: a soldier's conscience.

### Legal Risks

A loss of human agency poses serious challenges to compliance with IHL and IHRL – ultimately created by and for humans. Most artificial intelligence (AI) and robotics researchers question the reliability of technologies available in weapon systems and agree that it would be unlikely that these technologies would be able to adhere to the legal obligations under IHL. This relates primarily to the principles of proportionality, distinction and military necessity, which require e.g. qualitative human judgement, moral reasoning and understanding of context. Moreover, a weapon system operating outside human control and able to self-learn on the battlefield raises concerns of unpredictability and thus, puts civilians, combatants and the environment at risk. If such an autonomous weapon system fails, it cannot be held accountable.

### Technical & Operational Risks

AI and machine learning raise issues of algorithmic bias, a lack of explainability, malfunction and hacking, among others. In combination with chaotic and foggy battlefield environments this becomes an unacceptable risk. As weapon systems increase in autonomy, the predictability and reliability of outcomes is reduced. When combined with machine speed and the ability to act outside the comprehension of human beings this could lead to unintended escalations of crisis, friendly fire or even start a war.

### Security Risks

The high-tech military powers of China, Russia and the US, as well as some allies including France, have significantly increased funding available for research into and development of AI for military purposes, pointing towards an accelerating AI arms race. The possession of autonomous weapons also lowers the overall threshold to begin or join a military conflict due to expected reduced economic and political costs. Because the technology necessary to produce autonomous weapons are cheap and easy to obtain, military powers could mass-produce these weapons, increasing the likelihood of proliferation and mass killings. This includes proliferation to dictators and non-state actors such as terrorist groups – maybe in less advanced, but much more dangerous and unreliable variants.

## STATES' DISCUSSIONS AT THE UNITED NATIONS

Since 2014, states have held numerous meetings related to *lethal autonomous weapon systems* within the CCW framework. Although a majority of states prefers moving to a negotiating mandate for a legally-binding instrument and 28 call for an outright ban, a small number have taken advantage of the consensus rule to obstruct the process. These are, most notably, the United States and Russian Federation, United Kingdom, Republic of Korea, Australia and Israel – all of whom invest funds and efforts in the development of autonomous weapons. China is the only country of the five permanent members of the UN Security Council, which has called for a ban on the use of autonomous weapon systems. Still, it invests heavily in the development of autonomous weapons and should thus be viewed with caution. Germany is proposing a non-binding political declaration to regulate AWS although the coalition agreement currently in force requires the government to support a ban on AWS.



## SELECTION OF WEAPON SYSTEMS OF BAN-REFUSERS

This Dirty Profit Report already includes weapon systems with decreasing meaningful human control from the United States, United Kingdom and Israel. Therefore, certain developments are highlighted in the Russian Federation, Republic of Korea and Australia, who all refuse a ban on autonomous weapon systems. China was also included due to substantial investments in AI for military purposes.

### South Korea

Samsung Techwin (now Hanwha Techwin) and Korea University jointly developed the sentry robot SGR-A1 for the Korean Demilitarized Zone (DMZ). In principal, it is supposed to act like a human soldier. The robot ought to detect enemy soldiers approaching the DMZ (presuming that any person crossing the line is an enemy) through its integrated software relying on different cameras. If the robot identifies a threat, it can issue a warning and decide to carry out an attack with an integrated machine-gun. The system has reportedly been deployed in the DMZ, however, unlikely in an autonomous mode.

### Australia

In 2019, the University of New South Wales, the University of Queensland and the Defence Cooperative Research Centre for Trusted Autonomous Systems launched a \$ 9 million program to research ethical autonomous military robots. One researcher suggested to save children by training weapon systems to refrain from shooting at people below a certain height.<sup>271</sup> Such proposals would not only put children at risk that cross that threshold, but have little to do with embedding ethics in a machine.

### Russia

In 2017, President Vladimir Putin stated: *“Artificial intelligence is the future [...]. Whoever becomes the leader [...] will become the ruler of the world.”* Following this logic, Russia has developed a range of different robotic tanks such as Uran-9 or Vikhr, which are however still remotely controlled. The Kalashnikov arms manufacture declared to take a step further by developing *“a fully automated combat module based on neural network technologies that enable it to identify targets and make decisions”*.<sup>272</sup> Russian manufacturer Kalashnikov unveiled a new small loitering munition during the IDEX exhibition in Abu Dhabi. Experts believe that it might be adopted in the same way that Kalashnikov’s AK-47 assault rifle became the weapon of choice for armies, militias and revolutionaries across the globe.<sup>273</sup> According to the Russian Armed forces, Russia has recently tested its new Pantsir-S1 system which allegedly can operate *“fully autonomously”* in relation to decision-making, targeting and use of force.<sup>274</sup>

### China

China pursues the development of a large range of autonomous weapons to be deployed on land, air and water. An example is China’s push for underwater vehicles to be introduced in the early 2020s that according to news reports could *“perform a wide range of missions, from reconnaissance to mine placement to even suicide attacks against enemy vessels”*.<sup>275</sup> Such systems could increase the instability in contested waters such as the South China Sea and the Pacific Ocean. Chinese manufacturer unveiled various unmanned and armed aerial vehicles including the “Blowfish” system during the IDEX 2019 exhibition in Abu Dhabi. According to specialized media the Blowfish system can be controlled either manually or through autonomous mode.<sup>276</sup>



Blowfish UAV at IDEX 2019 © Facing Finance

## CONCLUSION

Despite widespread concerns, weapons with decreasing meaningful human control over selecting and engaging targets are developing at a rapid pace. More than 4,500 AI and robotics researchers, 21 Nobel Laureates, the European Parliament, the UN Secretary General, Human Rights Council Rapporteurs, 100 NGOs across the globe united in the campaign *Stop Killer Robots*, as well as 28 states have therefore called for a ban on autonomous weapon systems – it is time for the financial industry to join this call and to undertake the necessary precautions in order to avoid investing in a risky, dangerous and insecure future.

# Harmful investments



F/A-18 Hornet at Kaivopuisto air show in Helsinki.  
© Petteri Ylinen via Flickr CC-BY-NC-ND 2.0

# European Banks – Defence policies compared

The bank policy assessments below rank the ten selected banks based on their policy approach to finance and investment in the defense sector. The criteria that are assessed include both weapons exports to controversial countries and the production of controversial weapons (cluster munitions, anti-personal and nuclear weapons). The policy assessment is based on the methodology of the Fair Finance Guide, a project by Oxfam International. For the most accurate and up to date information on these rankings refer to the Fair Finance Guide in the relevant country available online. For example, at [fairfinanceguide.de](http://fairfinanceguide.de)

As these banks selected were the European banks with highest exposure to the selected weapons companies, it is unsurprising that none of the banks score well on their policy assessment. BBVA scores the best of the banks at 54%. Only two banks score above 40%

BANK	POLICY RATING
BBVA	54%
BNP Paribas	47%
Commerzbank	39%
Barclays	34%
Crédit Agricole	31%
Lloyds	29%
Deutsche Bank	28%
Credit Suisse	25%
Santander	25%
UniCredit	22%

0-19%	20-39%	40-59%	60-79%	80-100%
-------	--------	--------	--------	---------

## Lethal Autonomous Weapon Systems and the development of increasingly autonomous weapons:

While the above assessment criteria do not include elements assessing the bank policies and approach to Lethal Autonomous Weapon Systems, it is clear that LAWS, or any weapons without human control would be illegal and would violate IHL (based on the ICRC assessment).

We expect banks therefore to take the relevant actions to ensure that they are not associated with human right violations related to the use of LAWS. In this regard we sent a letter to the banks selected in this study (i.e. those European banks with large investments in top global defence companies).

Two banks replied noting their awareness of the issue of LAWS: one response noted the bank was following closely the developments in the sector and is conducting significant research into the field of LAWS. It notes that the bank is aware of the scrutiny and escalates to senior management any cases where concern arises.

A second bank noted that they assess LAWS under their defence sector policy since they fall under the scope of the policy.\* The bank notes that LAWS are still subject to international discussions for a common and comprehensive definition, and therefore the bank does not include them in the list of “controversial weapons” that are systematically excluded, however, the equipment behind the transaction is analysed and evaluated both for its nature and the countries of destination, which includes exclusion rules set by the bank.

\* In this Policy, “defence and security equipment”, generally refers to weapons (whether controversial or not, see below), military and dual-use equipment, internal repression equipment, as well as security and police equipment.

**BANK SCORE ASSESSMENT**

<b>BBVA</b>	In relation to controversial weapons production BBVA scores satisfactorily- they exclude companies from all types of financing and investment that are related to anti-personnel landmines, cluster munitions, and ABC weapons. Regarding nuclear weapons, the exclusion applies to countries that have not ratified the Non-proliferation Treaty. With regard to arms exports, BBVA scores full points for having a satisfactory policy on arms embargoes, only full points here. It has a policy on preventing exports to countries that violate human rights, or where weapons could be used to violate human rights. BBVA has no policy on weapons exports to fragile states, corrupt regimes, or countries currently in armed conflict.
<b>BNP Paribas</b>	Scores well on policies addressing controversial weapons production. BNPs policy in relation to arms exports to controversial countries is limited. The only specific policy prohibits the supply of arms to countries under an arms embargo, BNP does well to apply this to all financial products and services. However, there are no further policies to address the additional concerns around exports to controversial countries.
<b>Commerzbank</b>	Although Commerzbank has a policy on controversial weapons covering cluster munitions, anti-personnel mines and nuclear weapons, these are only applied to investments. Commerzbank also does not refer to companies that are involved in such activities, but only to the activities themselves. This is true for export policies also, Commerzbank has policies stating that weapon exports to countries in armed conflict and those which abuse human rights are considered unacceptable. Commerzbank could improve by applying these policies to its corporate credits and third-party assets.
<b>Crédit Agricole</b>	While Crédit Agricole is satisfactory in its cluster munitions and anti-personnel landmines policy, the bank’s nuclear weapons policy is limited- particularly in scope. It also fails to take a clear prohibitive stance on the production, maintenance and trade in nuclear weapons. While the bank has a policy on all but one of the elements related to weapons exports, the policy leaves a loophole, and thus it does not appropriately address controversial exports.
<b>Lloyds</b>	Lloyds has a sufficient policy on cluster munitions and anti-personnel landmines, and in part sufficient for nuclear weapons (it does not apply to all countries, leaving exceptions for the UK, US, France). These policies only apply to trade finance and (in the case of arms embargoes) to corporate credits, these policies should be extended to third party and own accounts. The bank’s policies on arms exports are lacking – there is only a policy preventing arms exports to countries with arms embargoes. None of the other weapons export criteria are covered by a policy. The only arms export policy the bank does have, again, only applies to corporate credits.
<b>Deutsche Bank</b>	Deutsche Bank has acceptable policies on cluster munitions, anti-personnel landmines. On anti-personnel mines this policy could be improved by applying it to the bank’s management of own assets. While the bank has policies covering nuclear weapons, the policies are currently insufficient and the scope could be improved by covering its own asset management and that of clients. Deutsche Bank falls exceptionally short on policies related to arms exports, with no policies on exports to countries under arms embargoes, those with human rights concerns, or oppressive states.
<b>Credit Suisse</b>	Credit Suisse has sufficient policies on cluster munitions and anti-personnel landmines. Its policies on nuclear production, trade and manufacture are insufficient as they do not cover all elements nor are they widely applied. According to publicly available information the bank has no policies on arms exports to controversial countries.
<b>Santander</b>	Santander has policies for the “manufacture, trade or distribution” of anti-personnel landmines, cluster munitions, nuclear weapons, chemical weapons and biological weapons. These policies are not cognizably widely applied – they are not applied to corporate credits, own accounts or client accounts. Santander has no policies related to the export of arms to controversial countries.
<b>Barclays</b>	Barclays has policies on cluster munitions, anti-personnel landmines, nuclear weapons and chemical and biological weapons, only the cluster munitions policy covers wider financing, for example management of the bank’s own assets and corporate credits. The bank has a vague public statement on arms exports to countries where there is a risk that the weapons could be used for serious violations of international human rights and humanitarian law. It is unclear how widely this policy applies. The bank has very limited policies on arms exports and there is no clear exclusion of financing for companies exporting to conflict zones, to fragile states, to states with corruption in defense spending – although Barclays noted in their response that they do consider these, it is unclear how or to what extent, or what actions are taken. The bank policies are held internally and Barclays provides a publicly-available statement on their defence policy, they also provided further information to our request. However, it is advised that Barclays make publicly-available their detailed policy on the defense sector.
<b>UniCredit</b>	The bank’s policies on cluster munitions and landmines, as well as nuclear and biological and chemical weapons are acceptable but not applied to asset management or corporate credits. The bank has no policies on exports to controversial countries.

# BlackRock Inc. – Sustainability champion or Lord of War?

In 2018, when the CEO of the world's largest asset manager<sup>277</sup> (with assets under management of US\$5.98 trillion)<sup>278</sup> wrote a letter to all the companies in their portfolio, stating that they should show how they make “a positive contribution to society” the financial media reported this as a push by Blackrock to make sustainable investing mainstream. But what impact can Blackrock really have if it does not focus on its own investment strategies?

**Our research into the asset manager has shown that it has investments of €32.6 billion in the weapons companies in this report.** This is far more than all ten European banks combined.

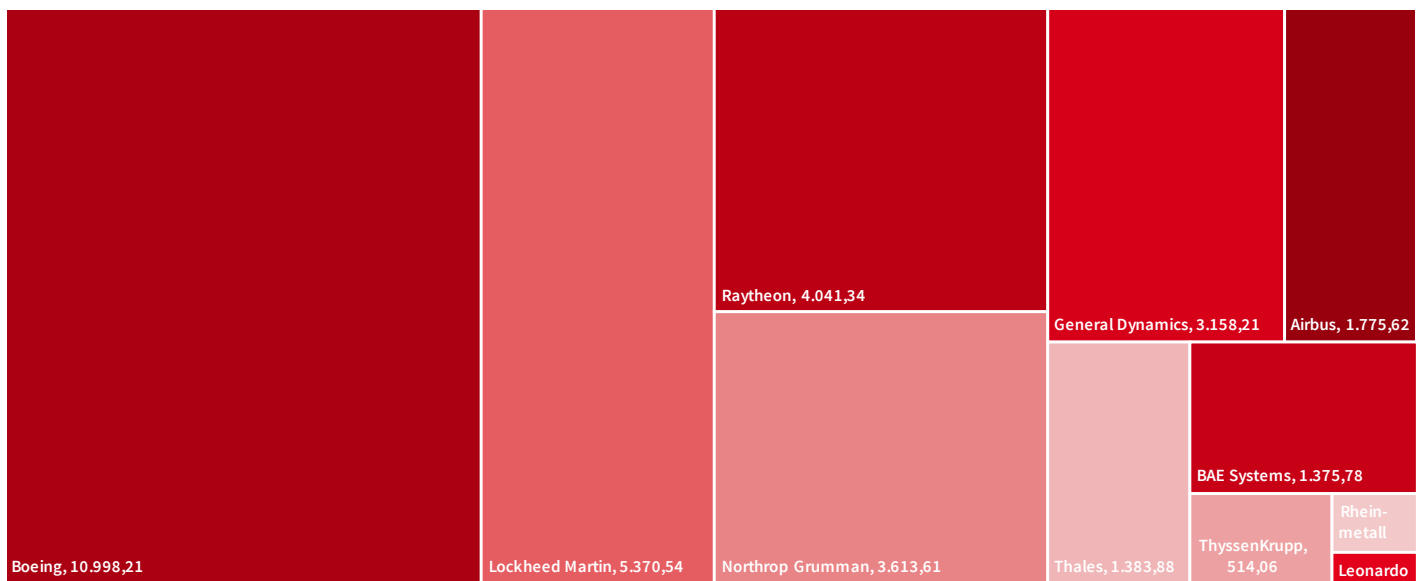
Unlike the banks that we investigated in this report, BlackRock does not have any publicly available general investment policies with respect to the weapons industry. It does not have an exclusion policy covering controversial arms, the controversial arms trade, nor does it screen companies which deliver military goods to controversial countries. As this seemed implausible, we contacted Blackrock to query this but received no response. When Blackrock states it expects companies to make a positive contribution to society, the production of controversial weapons and the selling of weapons to conflict zones seem contradictory to this goal.

BlackRock does apply exclusion criteria to specific portfolios, for example some investments will screen out companies which operate in controversial sectors, such as fossil fuels, tobacco or weapons.<sup>279</sup> How far clients are willing to be exposed to these sectors, depends on the client- some may want to exclude only those companies which earn significant revenue from cluster munitions, while others will have no tolerance and prefer to exclude any company earning revenue from any weapons.<sup>280</sup> Blackrock leaves the sustainability choice to the client – citing that “clients will still have the ability to buy elsewhere”.<sup>281</sup> There is a move by clients to demand more ESG compliant funds, but asset managers have differing ways of dealing with this, making it confusing for clients. For a client to decide where to invest its money, considerable information and knowledge of the investing landscape, as well as of the ESG performance of companies is required. While institutional investors may have a better idea of sustainability criteria, the lack of standardised rules and consistent definition of “ESG investing” mean retail investors in particular are often less well informed.

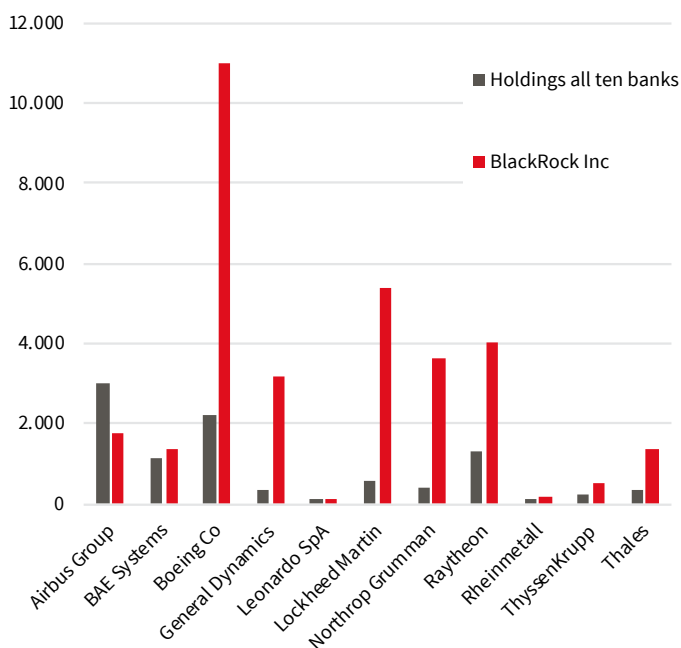
Recently a group of asset managers with a combined \$6 trillion in AuM have demanded that index providers remove controversial weapons from mainstream indices<sup>282</sup> and numerous asset managers already have policies preventing investment in controversial weapons – Blackrock relies heavily on index funds, in particular for its sustainability and ESG offerings. Yet Blackrock has not joined the call to exclude controversial weapons from indices.<sup>283</sup> Blackrock has also made no commitments to exclude controversial weapons from its own funds. Moreover, it is investing in companies manufacturing cluster munitions and nuclear weapons. The production of cluster munitions has been banned in over 100 countries because of their indiscriminate killing.<sup>284</sup> According to the NGO PAX, BlackRock has invested \$70.52 million in some of the most well-known companies producing cluster munitions.<sup>285</sup> Nuclear weapons have also been prohibited by a UN treaty since 2017. The treaty is not in force yet but has 70 signatory States and 22 States Parties.<sup>286</sup> Nonetheless, BlackRock has invested \$38.381 million in 18 of the top 20 companies that are most heavily involved in the nuclear weapon industrial complex, including BAE System, Airbus, Boeing, General Dynamics, Northrop Grumman, Lockheed Martin and Thales.<sup>287</sup>

BlackRock manages shares and bonds of every weapon company analysed in this study to the value of €32.6 billion. It's largest holding, of the selected companies, is in Boeing (€11 billion in managed shares and bonds), a company which is mainly exporting to the UAE and Saudi Arabia, both involved in the war in Yemen. It's second largest, Lockheed Martin (€5.3 billion), is developing controversial weapons, including nuclear weapons and fully autonomous weapons, in addition to exporting thousands of missiles to countries in conflicts. Also its involvement in Raytheon (€4 billion in managed shares and bonds) has to be seen as controversial, as the company is one of the largest exporters to the Saudi-led coalition in Yemen. The use of Raytheon's weapons in Yemen have been associated with the violation of IHL (as shown in this report). BlackRock also manages shares and bonds of the largest German arms producer Rheinmetall (€200 million), a company which is subject to a lawsuit following the implication that its product components have been used in Yemen (aerial bombing). By supporting these companies, BlackRock is economically benefiting from the killing happening in Yemen.

**Diagram: Share and bond holdings of Blackrock in selected weapons companies (in € million):**



**Graph: Share and bond holdings of blackrock compared to the combined ten European banks in this study (in € millions):**



BlackRock's size and vast assets under management mean it can have a significant impact on socially responsible investing, yet it does not apply ESG criteria across all its active investment products nor does it have a general investment policy with respect to weapons – placing the onus instead on the client to decide where to invest.<sup>288</sup> Consequently, BlackRock is able to wash its hands of all responsibility in its investments into major weapon contractors. As an asset manager, BlackRock acts as an agent on behalf of clients and should ensure that all of the funds are ESG compliant, with strong ESG guidelines and exclusion criteria and it should onboard no new funds that do not meet these criteria. In this way, BlackRock would take responsibility for its product offering.

# Investing Money *Safely* – A Deadly business!

Over the past ten years the assets managed by German financial institutions have doubled to €3 trillion. One third of these assets under management on the German market are retail funds<sup>289</sup>. The most important asset managers are Allianz Global Investors (AGI), Deka Investment, DWS and Union Investment, together these four asset managers make up more than 70 percent of the German market<sup>290</sup>. Their impact is in part due to the fact that they can rely on well-established distribution channels: Deka Investment sells its products exclusively via the large number of around 400 saving banks (*Sparkassen*); Union Investment collaborates with the cooperative banking sector (*Volks- und Raiffeisenbanken*); DWS works together with the branches of Deutsche Bank and also with the insurer Zurich; and AGI partners with Commerzbank as well as selling its funds through the network of agents of the insurer Allianz.

Due to the close proximity, savers mostly rely on their bank advisers, blindly hoping that these advisers will invest their money the “right” way. Survey results show that German savers do not want their own money to be invested in the arms industry<sup>291</sup> – nevertheless, only around 5–10% of assets under management actually take into account specific exclusion criteria for the industry.

General exclusion criteria for the arms industry are not applied to the majority of retail funds sold by the large German asset managers. This means that the money belonging to German savers could be invested in arms companies – often without their knowledge.

**DWS Group**<sup>292</sup> has been a listed asset manager since March 2018, with Deutsche Bank still holding a majority stake. DWS excludes producers of cluster munitions and landmines from its investment universe and states that they take ESG criteria into account in their investment decisions. They note that they have a proxy voting policy in place and engage in discussions with companies regarding ESG issues. However, in practice this means that DWS can still invest in nuclear weapon companies and also in companies exporting their arms to areas of conflict and war. Deutsche Bank itself adopted a new policy on controversial weapons last year, incl. nuclear weapons, in order to at least try to limit financial links with nuclear weapons companies, but this policy does not extend to DWS.

The investigation undertaken shows that DWS is invested in all of the eleven researched weapons companies. Almost half of the money is invested in the aircraft manufacturers Boeing and Airbus. The military F-15 jets made by Boeing and the Eurofighter jets of Airbus, BAE Systems and Leonardo, are the current focus of public criticism as these jets are frequently used in the war in Yemen by Saudi-Arabia and its allies. The approximately 20,000 air raids are responsible for the death of thousands of civilians and the destruction of a large number of essential/important infrastructure facilities. Moreover, Airbus, BAE Systems und Leonardo also cooperate in the joint venture MBDA, which is one of the world’s leading manufacturers of all types of missiles- including the production of nuclear missiles for the French army.

**Allianz Global Investors** is a global investment management company owned by the global financial services group Allianz.<sup>293</sup> It manages over €500 billion in assets on behalf of it’s institutional and retail clients. The parent company Allianz excludes producers of cluster munition, landmines, biological and chemical weapons. Besides this, the German branch of Allianz, Allianz Deutschland AG, does not invest in producers of nuclear weapons due to increased pressure and criticism over this issue in Germany and by German clients. AGI follows a similar approach as with DWS: they integrate ESG analysis in their investment strategy without limiting their investment universe or pushing for strict exclusion criteria. AGI has also adopted an engagement and proxy voting strategy, with the aim of pushing for improved ESG performance of the companies.

When diving into the numbers in our research, it’s clear that AGI is still significantly invested in the arms sector. AGI holds shares or bonds in all of the eleven researched companies, mainly in the large American companies Boeing, Raytheon, Northrop Grumman and Lockheed Martin. Raytheon and Northrop Grumman are heavily involved in the development of autonomous weapons systems and this could pose a substantial reputational risk for these asset managers.

**Deka Investment** is essentially the investment arm of the savings banks in Germany.<sup>294</sup> Producers of cluster munitions and landmines are not part of the investment universe. Much like its competitors, the investment strategy of Deka Investment does not focus on exclusion criteria, but rather on a broader, non-binding engagement strategy. Deka also has in place a proxy voting policy and is engaged in dialogue with many companies, in part pushing for ESG commitments.

According to our data, Deka is invested in eight of the eleven companies researched. This includes the companies Airbus, Boeing, Rheinmetall and BAE Systems. All these companies provide equipment like jets, missiles and munition to Saudi-Arabia and its allies, which are also being used in the long and vicious war in Yemen. Furthermore, Deka is invested in ThyssenKrupp, one of the most important submarine and warship manufacturers worldwide. In particular the companies' exports to authoritarian regimes like Egypt and Turkey have caused a flood of negative headlines in recent years.

The asset manager of the German cooperative banking sector, **Union Investment**, only has one absolute taboo regarding investments in the arms industry they exclude producers of cluster munition and landmines.<sup>295</sup> Overall, Union Investment has lower investments in the arms industry than its competitors, however, Union's strategy is, rather than to divest from certain deadly business branches generally, to engage with the sector. Last summer, Union announced it would divest little by little from producers of nuclear weapons. According to our data, this commitment has not yet been fulfilled. Union is still invested in nuclear weapon producers such as Airbus, Boeing and Northrop Grumman. Airbus and Boeing are producing key components for nuclear missiles and Northrop Grumman is also involved in the upgrading of missiles for the US and UK army.

It is clear that German asset managers currently do not place any convincing restrictions on investments in arms companies engaging in controversial arms trade or on nuclear weapon producers. Experience from the cluster munition and landmine campaigns shows that a divestment strategy from harmful products and companies is possible and has impact. There is also at present no known strategies on how German asset managers want to deal with, for instance, IT companies providing AI technologies that can be used with autonomous weapons without meaningful human control- or how to deal with their manufacturers.

An engagement strategy with arms companies whose business model is based on exports to countries with the highest military budgets worldwide, including authoritarian regimes- is doomed to fail. Allianz, Deka, DWS and Union should rethink their investment strategy and exclude, at the very least, producers of the most controversial weapons systems and exporters to regions in conflict and war from their investment universe. Such divestment efforts would take into account that the majority of Germans are against arms exports and the production of nuclear weapons and that they do not want their money invested in this deadly business.

**Table: Bond- and Shareholdings of the largest German investment companies**

	Airbus	BAE Systems	Boeing	General Dynamics	Leonardo	Lockheed Martin	Northrop Grumman	Raytheon	Rheinmetall	Thales	Thyssen-Krupp	TOTAL
<b>Allianz Global Investors</b>	103.94	57.71	466.85	5.06	23.89	143.01	166.62	192.76	76.45	5.46	16.25	1,258.01
<b>Deka Investment</b>	270.16	69.90	25.37		51.32		60.24		53.55	82.47	120.62	733.62
<b>DWS</b>	500.36	196.07	178.07	14.28	5.47	96.36	61.35	301.63	23.55	31.15	87.37	1,495.69
<b>Union Investment</b>	156.24	4.41	36.80		3.43	0.15	168.49	5.95			65.04	440.52
<b>TOTAL</b>	<b>1,101.93</b>	<b>429.65</b>	<b>1,452.61</b>	<b>143.02</b>	<b>125.60</b>	<b>377.52</b>	<b>654.86</b>	<b>642.89</b>	<b>156.81</b>	<b>140.65</b>	<b>314.06</b>	<b>5,539.60</b>



# Recommendations for banks and financial institutions

Frankfurt Financial Photo  
by Jan-Philipp Thiele on Unsplash

### **Financing of and Investment in companies exporting arms to controversial countries:**

- Banks and institutional investors must introduce a policy that excludes controversial arms trade. This should be applied to own accounts, third party accounts and corporate credits.
- Banks and institutional investors must improve their policies by referring to and admitting the ATT (Article 6.3.) and exclude any financial relationship with arms companies that supply weapons to war zones, weapons used in the commission of genocide, crimes against humanity, grave breaches of the Geneva Conventions of 1949, attacks directed against civilian objects or civilians protected as such, or other war crimes as defined by international agreement.<sup>296</sup>

Currently all of the banks covered in this report have an exclusion policy for controversial weapons, but policies covering the many factors related to the controversial arms trade are more limited. From our point of view, policies regarding the controversial arms trade must cover the following issues: delivery of weapons and military goods to countries with an arms embargo, to unfree countries, to countries violating fundamental principles of human rights, to countries engaged in an armed conflict, to fragile states, to countries where corruption is high and to countries where poverty alleviation is limited by military expenditure. Very few of the banks in this report have policies in place that cover the financing and investments in arms trading companies.

- Banks and institutional investors should identify countries which are problematic for arms trade and screen companies that deliver to these countries. Companies with poor policies related to arms export should trigger additional due diligence.

We suggest that the methodology used in this report, as in the PAX report (see methodology section of this report), could provide a basis for identifying countries which are controversial for arms exports, and could therefore associate the bank with human rights violations.

- Banks and institutional investors should publish exclusion lists related to countries which are considered controversial for arms trade.
- Banks and institutional investors must apply the UN Guiding Principles on Business and Human Rights and ensure that regardless of individual states' approaches to export regulations, that banks ensure that through their investment and financing decisions they will not be facilitating or linked to human rights violations through their investment and financing decisions.
- Banks and institutional investors must be more transparent about their engagement processes with arms exporting companies, including an annual report on the number of companies with whom they have engaged and the relevant social and governance issues concerned, and the consequences they drew from that dialogue.

### **Financing and Investment in companies producing controversial weapons:**

The majority of the banks covered in this report have acceptable policies covering cluster munitions and anti-personnel mines, however, the coverage related to nuclear weapons could be improved in many cases.

*Production of, maintenance of, and trade in nuclear weapons, including important parts of nuclear weapons, is unacceptable. Therefore, banks and financial institutions must:*

- Exclude all nuclear weapon producing and associated companies. This includes the whole company and not just the parts of the company participating in the development, testing, production, maintenance or trade of nuclear weapons related technology, parts, products or services.
- This should be applied across all entities within the group, including all subsidiaries in all markets, to all asset management classes – passive and active, internal and external and to all existing and future investments.

Banks and other financial institutions should also where applicable lobby mainstream indices for the removal of all weapons companies involved in controversial weapons. They can help to achieve this by signing on to the Open Letter to Index Providers coordinated by Swiss Sustainable Finance Engagement Initiative.

*Development, production and testing of lethal autonomous weapons systems, which can select and engage targets without meaningful human control over individual attacks, is unacceptable.*

Only two banks of the ten banks requested responded to Facing Finance in relation to the topic of autonomous weapons, and noted that they were aware of the issue. Further research and policy development are necessary by banks and could be done in the following way:

- Banks and other financial institutions are recommended to monitor the development of these systems. Technological development of autonomous weapons is rapid, and opposition is strong – for this reason investments in producers could become a reputational concern. For banks, being associated with companies that are moving swiftly towards the development of autonomous weapon systems, could also link them to potential human rights violations.
- Banks must acknowledge that autonomous weapons, or any weapon without human control, are illegal and would violate IHL (based on the ICRC assessment). This obligation and legal background is defined within the ICRC report “Autonomous weapon systems under international humanitarian law”.<sup>297</sup>

### Recommendations for Asset Managers:

Asset managers in their role of managing their own and client funds also need to ensure that they apply relevant human rights due diligence to their approach. The OECD guidelines note that a relationship between an investor and investee company including a minority shareholding can be considered a “business relationship” under the OECD Guidelines. This means that the UNGP on Business and Human Rights should be applied to these financial relationships. The OECD, in line with the UNGPs on Business and Human Rights, states business must: “Seek to prevent or mitigate adverse impacts where they have not contributed to that impact, when the impact is nevertheless directly linked to their operations, products or services by a business relationship. This is not intended to shift responsibility from the entity causing an adverse impact to the enterprise with which it has a business relationship.”<sup>298</sup>

- Asset managers should use their substantial leverage to engage with weapons companies to improve their human rights records. A recent study of asset managers, by the organisation ShareAction, found that “Only 8 asset managers, or 20%, provide a full list of companies engaged with over the year. Best practice engagement disclosure covers the total number, topics, and results of engagement with investee companies.”<sup>299</sup> Facing Finance supports transparency by asset managers in this regard.

- In the case of asset managers, Facing Finance strongly recommends and finds it is within the fiduciary duty of asset managers to inform their clients of the human rights risks associated with investment in arms producing companies exporting to controversial countries and also of investments in those companies producing controversial weapons. It is essential that asset managers communicate with clients regarding environmental, social and governance issues.
- Asset managers should also inform their clients of the potential and emerging human rights risks of investing in weapons companies and/or other (IT) companies that are actively working towards developing increasingly autonomous weapon systems and/or artificial intelligence technology used to reduce or eliminate the human control on killing decisions.
- Asset managers should follow the approach of those who have chosen to divest entirely from controversial weapons including chemical biological weapons.<sup>300</sup>
- Asset managers that provide passive funds that replicate the market indices, should lobby these indices for the removal of all weapons companies involved in controversial weapons. Asset managers can helpfully achieve this by signing on to the Open Letter to Index Providers coordinated by Swiss Sustainable Finance Engagement Initiative.

# Appendix to the report



Mazrak camp in the tough mountainous scrublands of Yemen's north-west border with Saudi Arabia is now home to more than 10,000 people displaced by the escalating war between the government and rebels from the Huthi clan.

© IRIN photos via Flickr BY-NC-ND-2.0

APPENDIX 1: TABLE OF WEAPONS EXPORTS BY COMPANY

**Airbus Group**

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon description	Year of order/ licence	Year(s) of deliveries	Number delivered/ produced
Egypt	yes	yes	Spain	8	C-295	Transport aircraft	2014	2015–2016	8
Egypt	yes	yes	Spain	4	C-295	Transport aircraft	2015	2016	4
Saudi Arabia	yes	yes	Germany (FRG)	23	EC145	Light helicopter	2016	2017	10
Saudi Arabia	yes	yes	Spain	3	A-330 MRTT	Tanker/transport aircraft	2009	2014–2015	3
Saudi Arabia	yes	yes	Spain	3	C-295	Transport aircraft	2015	2015–2016	3
Saudi Arabia	yes	yes	Spain	1	C-295MPA	Maritime patrol aircraft	2015	2017	1
Turkey	yes	no	Spain	10	A400M Atlas	Transport aircraft	2003	2014–2017	5
UAE	yes	yes	Spain	5	C-295	Transport aircraft	2017		
UAE	yes	yes	France	2	Helios-2	Reconnaissance satellite			
Kuwait	no	yes	France	30	EC725 Super Cougar	Transport aircraft	2016		

**MBDA and Eurofighter**

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon type	Year of order/ licence	Year(s) of deliveries	Number delivered/ produced
Saudi Arabia	yes	yes	United Kingdom	24	Typhoon Block-20	FGA aircraft	2007	2015–2015	
Saudi Arabia	yes	yes	United Kingdom	48	Typhoon Block-8	FGA aircraft	2007	2009–2017	
Kuwait	no	yes	Italy	28	Typhoon Block-20	FGA aircraft	2016		
Saudi Arabia	yes	yes	France	49	MPCV		2011	2013–2015	49
Saudi Arabia	yes	yes	France	130	Mistral	Portable Surface-to-air missile	2013	2016–2017	130
Saudi Arabia	yes	yes	United Kingdom	1000	Brimstone	Air-to-surface missile	2017		
Saudi Arabia	yes	yes	France	800	Mistral	Portable Surface-to-air missile	2011	2013–2015	800
Saudi Arabia	yes	yes	United Kingdom	100	Storm Shadow/ SCALP	Air-to-surface missile	2013	2016–2017	100
UAE	yes	yes	France	150	MM-40-3 Exocet	Anti-ship M/ Surface-to-surface missile	2006	2010–2016	150
UAE	yes	yes	Italy	100	Marte-2	Anti-ship missile	2009	2013–2015	100
UAE	yes	yes	Italy		Marte-2	Anti-ship missile	2017		
Saudi Arabia	yes	yes	United Kingdom		Meteor	Beyond visual range air-to-air missile	2014	2017	
Egypt	yes	yes	France	50	MM-40-3 Exocet	Anti-ship M/ Surface-to-surface missile	2014	2017	10
Egypt	yes	yes	France	100	MICA	Beyond visual range air-to-air missile	2015	2017	25

Egypt	yes	yes	France	150	MICA	Beyond visual range air-to-air missile	2015	2015–2017	90
Egypt	yes	yes	France	25	ASTER-15 SAAM	Surface-to-air missile	2015	2015	25
Egypt	yes	yes	France	15	MM-40-3 Exocet	Anti-ship MI/ Surface-to-surface missile	2015	2015	15
Egypt	yes	yes	France	50	Storm Shadow/ SCALP	Air-to-surface missile	2015	2015–2017	30
Kuwait	no	yes	Italy		Marte-ER	Anti-ship missile	2018		

## BAE Systems

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon description	Year of order/ licence	Year(s) of deliveries	Number delivered/ produced
Bahrain	yes	yes	United States	56	WGU-59 APKWS	Air-to-surface missile	2018		
Iraq	yes	no	United States	2000	WGU-59 APKWS	Air-to-surface missile	2015	2016–2017	1150
Lebanon	yes	no	United States	2000	WGU-59 APKWS	Air-to-surface missile	2016	2017	500
Saudi Arabia	yes	yes	United Kingdom	22	Hawk-100	Trainer/combat aircraft	2012	2016–2017	22
Saudi Arabia	yes	yes	United Kingdom	22	Hawk-100	Trainer/combat aircraft	2015	2017	4
Saudi Arabia	yes	yes	Turkey	320	M-113A300	Armoured personnel carrier	2011	2013–2015	320
Saudi Arabia	yes	yes	Turkey	350	M-113A300	Armoured personnel carrier	2013	2015–2017	350
Saudi Arabia	yes	yes	United States	20	M-88A2 HERCULES	Armoured recovery vehicle	2016		
UAE	yes	yes	Sweden	2	SAK-70 Mk-2 57mm	Naval gun	2013	2017	2
Jordan	no	yes	United States	100	WGU-59	Advanced Precision Kill Weapon System (APKWS)	2014	2015–2016	100

## The Boeing Company

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon description	Year of order/ licence	Year(s) of deliveries	# delivered/ produced
Egypt	yes	yes	United States	25	RGM-84L Harpoon-2	Anti-ship MI/ Surface-to-surface missile	2003	2013–2015	25
Egypt	yes	yes	United States	20	RGM-84L Harpoon-2	Anti-ship MI/ Surface-to-surface missile	2016	2017	10
Saudi Arabia	yes	yes	United States	400	RGM-84L Harpoon-2	Anti-ship MI/ Surface-to-surface missile	2012	2016–2017	120
Saudi Arabia	yes	yes	United States	650	AGM-84H SLAM-ER	Air-to-surface missile	2013	2016–2017	110
Saudi Arabia	yes	yes	United States	6	P-84 Poseiden	ASW aircraft	2018		
Saudi Arabia	yes	yes	United States	48	CH-47F Chinook	Transport helicopter	2017		
Turkey	yes	no	United States	6	CH-47F Chinook	Transport helicopter	2011	2016	6

Turkey	yes	no	United States	4	CH-47F Chinook	Transport helicopter	2015		
Turkey	yes	no	United States	1000	JDAM	Guided bomb	2015	2017	250
Turkey	yes	no	United States	100	JDAM	Guided bomb	2017	2018	100
UAE	yes	yes	United States	5000	GBU-39 SDB	Guided bomb	2014	2015–2017	2500
UAE	yes	yes	United States	3600	JDAM	Guided bomb	2014	2015–2016	3600
UAE	yes	yes	United States	1500	JDAM	Guided bomb	2017	2018	1500
Lebanon	yes	no	United States	6	ScanEagle	Unmanned aerial vehicle (UAV)	2017		
Saudi Arabia	yes	yes	United States	12	AH-64E Apache Guardian	Combat helicopter	2009	2014–2015	12
Saudi Arabia	yes	yes	United States	24	AH-64E Apache Guardian	Combat helicopter	2011	2015–2016	24
Saudi Arabia	yes	yes	United States	17	AH-64E Apache Guardian	Combat helicopter	2018		
Saudi Arabia	yes	yes	United States	84	F-15SG	Fighter/ground attack aircraft	2011	2016–2017	28
Saudi Arabia	yes	yes	United States	70	F-15SG	Fighter/ground attack aircraft	2011	2016	2
Saudi Arabia	yes	yes	United States	12	AH-64E Apache Guardian	Combat helicopter	2012	2015	12
Saudi Arabia	yes	yes	United States	600	JDAM	Guided bomb	2012	2016	600
Saudi Arabia	yes	yes	United States	2645	GBU-39 SDB	Guided bomb	2016	2018	
Saudi Arabia	yes	yes	United States	1000	GBU-39 SDB	Guided bomb	2013	2017	200
Saudi Arabia	yes	yes	United States	24	AH-6S	Combat helicopter	2014	2016–2017	24
Saudi Arabia	yes	yes	United States	5200	JDAM	Guided bomb	2016	2016–2017	5200
Saudi Arabia	yes	yes	United States	24	AH-64E Apache Guardian	Combat helicopter	2017		
Saudi Arabia	yes	yes	United States	6	P-8A Poseidon	Anti-submarine warfare aircraft	2017		
Turkey	yes	no	United States	4	Boeing-737 AEW&C	Airborne early-warning and control aircraft	2002	2014–2015	4
UAE	yes	yes	United States	12	CH-47F Chinook	Transport helicopter	2011	2012–2015	12
UAE	yes	yes	United States	2	C-17A Globemaster-3	Heavy transport ac	2015	2015	2
UAE	yes	yes	United States	4000	JDAM	Guided bomb	2016		
Jordan	no	yes	United States		JDAM	Guided bomb	2015	2018	198
Kuwait	no	yes	United States	28	F/A-18E Super Hornet	FGA aircraft	2018		
Kuwait	no	yes	United States	51	JDAM	Guided bomb	2016	2017	

## General Dynamics Corp

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon description	Year of order/licence	Year(s) of deliveries	Number delivered/produced
Egypt	yes	yes	United States	125	M-1A1 Abrams	Tank	2011	2015–2017	90
Saudi Arabia	yes	yes	United States	264	LAV-25 turret	Infantry fighting vehicle turret	2009	2011–2015	264
Saudi Arabia	yes	yes	United States	314	M-1A2S	Tank	2009	2012–2017	314
Saudi Arabia	yes	yes	United States	153	M-1A2S	Tank	2016		
Saudi Arabia	yes	yes	Canada	571	Piranha LAV-6	Armoured personnel carrier	2014		
Saudi Arabia	yes	yes	Canada	119	Piranha LAV-6 AT	Tank destroyer	2014		

Saudi Arabia	yes	yes	Canada	119	Piranha LAV-6 FSV	Armoured fire support vehicle	2014		
Saudi Arabia	yes	yes	Canada	119	Piranha/LAV-6 IFV	Infantry fighting vehicle	2014		
Saudi Arabia	yes	yes	Canada	724	Piranha	Armoured personnel carrier	2009	2011–2015	724
Saudi Arabia	yes	yes	Canada	155	Piranha	Armoured personnel carrier	2011	2015	155
Yemen	yes	no	UAE	20	Cougar	Armoured personnel carrier	2016	2016	20
Kuwait	no	yes	United States	218	M-1A2S	Tank	2016		

## Leonardo SpA

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon description	Year of order/licence	Year(s) of deliveries	#delivered/produced
Turkey	yes	no	Italy	50	A-129C Mangusta	Combat helicopter	2008	2016–2017	18
Turkey	yes	no	Italy	9	A-129C Mangusta	Combat helicopter	2010	2014–2015	9
Turkey	yes	no	Italy	16	Compact 40L70	Naval gun	2007	2011–2015	16
Turkey	yes	no	Italy	1	Göktürk-1	Recce satellite	2009	2016	1
Turkey	yes	no	Italy	2	Super Rapid 76mm	Naval gun	2014	2017	1
Egypt	yes	yes	Italy	3	Super Rapid 76mm	Naval gun	2006	2013–2015	3
Egypt	yes	yes	Italy	1	Super Rapid 76mm	Naval gun	2011	2015	1
Egypt	yes	yes	Italy	4	Super Rapid 76mm	Naval gun	2014	2017	1
Egypt	yes	yes	Italy	1	Super Rapid 76mm	Naval gun	2015	2015	1
Saudi Arabia	yes	yes	Italy	2	RAT-31S	Air search radar	2013	2015	2
Saudi Arabia	yes	yes	Italy	3	Super Rapid 76mm	Naval gun	2015		
Saudi Arabia	yes	yes	Italy	6	RAT-31S	Air search radar	2016	2016–2017	6
Saudi Arabia	yes	yes	Italy	4	Super Rapid 76mm	Naval gun	2017		
UAE	yes	yes	Italy	6	Super Rapid 76mm	Naval gun	2003	2012–2016	6
UAE	yes	yes	Italy	6	Orion RTN-25X	Fire control radar	2004	2011–2016	6
UAE	yes	yes	Italy	9	AW139	Helicopter	2015	2015	9

## Lockheed Martin

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Number ordered	Weapon designation	Weapon description	Year of order/licence	Year(s) of deliveries	Number delivered/produced
Bahrain	yes	yes	24	GMLRS	Guided rocket	2015	2017	24
Bahrain	yes	yes	25	AAQ-33 Sniper	Aircraft EO system	2017		
Bahrain	yes	yes	14	AGM-114K HELLFIRE	Anti-tank missile	2018		
Bahrain	yes	yes	19	F-16V	Fighter/ground attack aircraft	2017		
Egypt	yes	yes	20	F-16C Block-50/52	Fighter/ground attack aircraft	2010	2013–2015	20
Egypt	yes	yes	12	AAQ-33 Sniper	Aircraft EO system	2011	2013–2015	12



Egypt	yes	yes	356	AGM-114K HELLFIRE	Anti-tank missile	2015	2016–2017	356
Egypt	yes	yes	2	C-130J Super Hercules	Transport aircraft	2016		
Iraq	yes	no	18	F-16C Block-50/52	Fighter/ground attack aircraft	2011	2014–2015	18
Iraq	yes	no	20	AAQ-33 Sniper	Aircraft EO system	2012	2015	20
Iraq	yes	no	18	F-16C Block-50/52	Fighter/ground attack aircraft	2013	2016–2017	18
Iraq	yes	no	5000	AGM-114K HELLFIRE	Anti-tank missile	2014	2015–2017	5000
Lebanon	yes	no	50	AGM-114K HELLFIRE	Anti-tank missile	2014	2015	50
Lebanon	yes	no	100	AGM-114K HELLFIRE	Anti-tank missile	2015	2015	100
Saudi Arabia	yes	yes	193	AAQ-13 LANTIRN	Combat aircraft radar	2011	2016–2017	52
Saudi Arabia	yes	yes	158	AAQ-33 Sniper	Aircraft EO system	2012	2016–2017	52
Saudi Arabia	yes	yes	2	KC-130J Hercules	Tanker/transport ac	2013	2016	2
Saudi Arabia	yes	yes	2176	AGM-114L HELLFIRE	Anti-tank missile	2014	2015–2016	2176
Saudi Arabia	yes	yes	20	C-130J-30 Hercules	Transport aircraft	2015		
Saudi Arabia	yes	yes	4	MMSC	Frigate	2017		
Saudi Arabia	yes	yes	24	S-70/UH-60L	Helicopter	2012	2014–2015	24
Saudi Arabia	yes	yes	10	MH-60R Seahawk	Anti-submarine warfare helicopter	2015		
Saudi Arabia	yes	yes	8	S-70/UH-60L	Helicopter	2016		
Saudi Arabia	yes	yes	40	S-70/UH-60L	Helicopter	2017		
Saudi Arabia	yes	yes	30	S-70/UH-60L	Helicopter	2017		
Saudi Arabia	yes	yes	21	Patriot PAC-3	Surface-to-air missile/ Anti-ballistic missile system	2011	2014–2017	21
Saudi Arabia	yes	yes	320	MIM-104F PAC-3	Anti-ballistic missile	2015	2017	80
Saudi Arabia	yes	yes		Patriot PAC-3	Surface-to-air missile/ Anti-ballistic missile system	2015	2017	1
Saudi Arabia	yes	yes	5	Mk-41	Naval SAM system	2018		
Turkey	yes	no	100	F-35A JSF	FGA aircraft	2014		
Turkey	yes	no	69	S-70/UH-60L	Helicopter	2014		
UAE	yes	yes	390	GMLRS	Guided rocket	2015	2017	390
UAE	yes	yes	12	M-142 HIMARS	Self-propelled Multiple rocket launcher	2015	2017	12
UAE	yes	yes	124	MGM-140B ATACMS	Surface-to-surface missile	2015	2017	93
UAE	yes	yes	60	MIM-104F PAC-3	Anti-ballistic missile	2017		
Jordan	no	yes	100	AGM-114K HELLFIRE	Anti-tank missile	2014	2015	100
Jordan	no	yes	100	AGM-114K HELLFIRE	Anti-tank missile	2017	2018	30
Jordan	no	yes	2	TPS-77	Air search radar	2016	2017	1
Jordan	no	yes	1	M28	Skytruck transport	2015	2016	1
Jordan	no	yes	12	S-70/UH-60L	Helicopter	2016	2017	12
Jordan	no	yes		FGM-148 Javelin		2017		
Jordan	no	yes	144	GMLRS	GMLRS Guided rocket	2016	2017–2018	144
Kuwait	no	yes	6	Patriot PAC-3	Surface-to-air missile/ Anti-ballistic missile system	2008	2014–2016	
Kuwait	no	yes	60	MIM-104F PAC-3	Anti-ballistic missile	2013	2015	
Kuwait	no	yes	2	Patriot PAC-3	Surface-to-air missile/ Anti-ballistic missile system	2014	2016–2017	
Kuwait	no	yes	300	AGM-114L HELLFIRE	Anti-tank missile	2013	2015	300
Kuwait	no	yes	14	AAQ-33 Sniper	Aircraft EO system	2016		
Kuwait	no	yes	18	AAQ-33 Sniper	Aircraft EO system	2016		
Morocco	no	yes	1200	BGM-71 TOW	Anti-tank missile	2017–2018		400
Morocco	no	yes	600	BGM-71 TOW	Anti-tank missile	2016	2017–2018	600

## Northrop Grumman

Recipient	Controversial country for arms export	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon description	Year of order/licence	Year(s) of deliveries	Number delivered/produced
Bahrain	yes	yes	United States	26	APG-83 SABR	Combat Aircraft radar	2017		
Iraq	yes	no	United States	4	APG-68	Combat Aircraft radar	2012	2015	4
Turkey	yes	no	United States	163	APG-68	Combat Aircraft radar	2005	2009–2015	163

## Raytheon

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon description	Year of order/licence	Year(s) of deliveries	Number delivered/produced
Bahrain	yes	yes	United States	25	AIM-120C AMRAAM	Beyond visual range air-to-air missile	2010	2015	25
Bahrain	yes	yes	United States	264	BGM-71 TOW	Anti-tank missile	2016	2017	232
Egypt	yes	yes	Germany (FRG)	330	AIM-9L/I Sidewinder	Short range air-to-air missile	2017		
Egypt	yes	yes	United States	139	RIM-116A RAM	Surface-to-air missile	2005	2013–2015	139
Egypt	yes	yes	United States	8	MPQ-64 Sentinel	Air search radar	2017		
Iraq	yes	no	United States	50	AGM-65 Maverick	Air-to-surface missile	2011	2015	50
Iraq	yes	no	United States	150	AIM-7M Sparrow	Beyond visual range air-to-air missile	2011	2015–2016	150
Iraq	yes	no	United States	100	AIM-9L Sidewinder	Short range air-to-air missile	2011	2015	100
Iraq	yes	no	United States	300	Paveway	Guided bomb	2011	2015	300
Iraq	yes	no	United States	50	AGM-65 Maverick	Air-to-surface missile	2013	2016	50
Iraq	yes	no	United States	150	AIM-7M Sparrow	Beyond visual range air-to-air missile	2013	2016–2017	150
Iraq	yes	no	United States	100	AIM-9L Sidewinder	Short range air-to-air missile	2013	2016–2017	100
Iraq	yes	no	United States	300	Paveway	Guided bomb	2013	2016–2017	300
Lebanon	yes	no	United States	350	BGM-71 TOW	Anti-tank missile	2016	2017	350
Saudi Arabia	yes	yes	United Kingdom	2400	Paveway	Guided bomb	2013	2015	2400
Saudi Arabia	yes	yes	United States	600	AGM-88 HARM	Anti-radar missile	2011		
Saudi Arabia	yes	yes	United States	300	AIM-9X Sidewinder	Short range air-to-air missile	2011	2012–2017	220
Saudi Arabia	yes	yes	United States	3100	Paveway	Guided bomb	2011	2013–2016	3100
Saudi Arabia	yes	yes	United States	500	AIM-120C AMRAAM	Beyond visual range air-to-air missile	2013	2015–2017	355
Saudi Arabia	yes	yes	United States	355	AGM-154 JSOW	Guided bomb	2014	2016–2017	220
Saudi Arabia	yes	yes	United States	8120	Paveway	Guided bomb	2015	2016–2017	8120
Saudi Arabia	yes	yes	United States	618	AGM-154 JSOW	Guided bomb	2017		
Saudi Arabia	yes	yes	United States	100	RIM-116A RAM	Surface-to-air missile	2017		
Saudi Arabia	yes	yes	United States		RIM-162 ESSM	Surface-to-air missile	2017		

Saudi Arabia	yes	yes	United States	7	THAAD	Anti-ballistic missile system	2017		
Saudi Arabia	yes	yes	United States	4941	BGM-71F TOW-2B	Anti-tank missile	2014	2015–2017	4941
Saudi Arabia	yes	yes	United States	10747	BGM-71 TOW	Anti-tank missile	2014	2015–2017	10747
Saudi Arabia	yes	yes	United States	21	Patriot PAC-3	Surface-to-air missile/Anti-ballistic missile system	2011	2014–2017	21
Saudi Arabia	yes	yes	United States	320	MIM-104F PAC-3	Anti-ballistic missile	2015	2017	80
Saudi Arabia	yes	yes	United States		Patriot PAC-3	Surface-to-air missile/Anti-ballistic missile system	2015	2017	1
Saudi Arabia	yes	yes	United States	7	THAAD	ABM system	2018		
Turkey	yes	no	United States	400	RIM-162 ESSM	Surface-to-air missile	2009	2011–2016	346
Turkey	yes	no	United States	4	Mk-15 Phalanx	Close-in weapon system	2011	2017	2
Turkey	yes	no	United States	145	AIM-120C AMRAAM	Beyond visual range air-to-air missile	2014	2016–2017	72
Turkey	yes	no	United States	117	AIM-9X Sidewinder	Short range air-to-air missile	2014	2015–2016	117
Turkey	yes	no	United States	60	RIM-116A RAM	Surface-to-air missile	2014	2017	30
Turkey	yes	no	United States	2	Mk-15 Phalanx	Close-in weapon system	2015		
Turkey	yes	no	United States	4	Mk-15 Phalanx	Close-in weapon system	2015	2017	4
UAE	yes	yes	United States	237	RIM-162 ESSM	Surface-to-air missile	2006	2011–2016	237
UAE	yes	yes	United States	200	RIM-116A RAM	Surface-to-air missile	2007	2011–2016	200
UAE	yes	yes	United States	2	THAAD	Anti-ballistic missile system	2011	2015–2016	2
UAE	yes	yes	United States	96	THAAD missile	Anti-ballistic missile	2012	2015–2016	96
UAE	yes	yes	United States	25	RIM-116A RAM	Surface-to-air missile	2013	2017	25
UAE	yes	yes	United States	60	MIM-104F PAC-3	Anti-ballistic missile	2017		
UAE	yes	yes	United States	2000	Talon	Air-to-surface missile	2013	2015–2017	1500
UAE	yes	yes	United States	100	MIM-104C PAC-2	Surface-to-air missile	2017		
UAE	yes	yes	United States	13640	Paveway	Guided bomb	2017		
UAE	yes	yes	United States	300	AIM-9X Sidewinder	SRAAM	2018		
Kuwait	no	yes	United States	6	Patriot PAC-3	Surface-to-air missile/Anti-ballistic missile system	2008	2014–2016	6
Kuwait	no	yes	United States	60	MIM-104F PAC-3	Anti-ballistic missile	2013	2015	60
Kuwait	no	yes	United States		MIM-104F PAC-3	Anti-ballistic missile	2018	2024	
Kuwait	no	yes	United States	2	Patriot PAC-3	Surface-to-air missile/Anti-ballistic missile system	2014	2016–2017	2
Jordan	no	yes	UAE	166	Paveway Guided Bomb	Guided bomb	2014	2015	166

Jordan	no	yes	United States	85	AIM-120C AMRAAM	Beyond visual range air-to-air missile	2009	2013–2016	85
Jordan	no	yes	United States	200	Paveway Guided Bomb		2015	2015	200
Jordan	no	yes	United States	300	BGM-71 TOW	Anti-tank missile	2016	2016–2018	300
Jordan	no	yes	United States		FGM-148 Javelin	Anti-tank missile	2017		
Kuwait	no	yes	United States	209	MIM-104C PAC-2	Surface-to-air missile	2011	2014–2015	209
Kuwait	no	yes	United States	80	AIM-9X Sidewinder	Short range air-to-air missile	2013	2014–2015	80
Kuwait	no	yes	United States	1	AIM-9X Sidewinder	Short range air-to-air missile	2014	2016	1
Kuwait	no	yes	United States	60	AIM-120C AMRAAM	BVRAAM	2018		
Morocco	no	yes	United States	30	AIM-120C AMRAAM	Beyond visual range air-to-air missile	2009	2015–2016	30
Morocco	no	yes	United States	20	AIM-9X Sidewinder	Short range air-to-air missile	2012	2014–2015	20
Morocco	no	yes	United States	600	BGM-71 TOW	Anti-tank missile	2016	2017	300
Morocco	no	yes	United States	1200	BGM-71 TOW	Anti-tank missile	2017		

## Rheinmetall

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon description	Year of order/licence	Year(s) of deliveries	Number delivered/produced
Egypt	yes	yes	Germany	1280	Fahd	Armoured personnel carrier	1978	1986–2015	1280
Saudi Arabia	yes	yes	Italy	26	X-TAR	Air search radar	2011	2015–2016	26
Kuwait	no	yes	Germany	12	Fuchs-2	APC	2015	2017	12

## Thales

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon designation	Weapon description	Year of order/licence	Year(s) of deliveries	Number delivered/produced
Egypt	yes	yes	France	3	MRR-3D	Air search radar	2006	2013–2015	3
Egypt	yes	yes	France	1	MRR-3D	Air search radar	2010	2015	1
Egypt	yes	yes	Netherlands	3	Scout	Sea search radar	2006	2013–2015	3
Egypt	yes	yes	Netherlands	3	STING	Fire control radar	2006	2013–2015	3
Egypt	yes	yes	Netherlands	1	Scout	Sea search radar	2010	2015	1
Egypt	yes	yes	Netherlands	1	STING	Fire control radar	2010	2015	1
Egypt	yes	yes	Netherlands	4	SMART	Air search radar	2014	2017	1
Egypt	yes	yes	Netherlands	4	STING	Fire control radar	2014	2017	1
Egypt	yes	yes	France	1	FREMM	Frigate	2015	2015	1
Egypt	yes	yes	France	12	TALIOS	Aircraft EO system	2015	2016–2017	7
Saudi Arabia	yes	yes	France	60	Damocles	Aircraft EO system	2007	2009–2017	60
Saudi Arabia	yes	yes	France	20	Ground Master-60	Air search radar	2011	2013–2015	20

Saudi Arabia	yes	yes	France	10	FLASH	Anti-submarine warfare sonar	2015		
Saudi Arabia	yes	yes	Netherlands	225	SQUIRE	Ground surv radar	2009	2011–2015	225
Turkey	yes	no	France	15	Ocean Master	MP aircraft radar	2002	2013–2014	9
Turkey	yes	no	Netherlands	2	STING	Fire control radar	2014	2017	1
Turkey	yes	no	Netherlands	2	SMART	Air search radar	2011	2017	2
Turkey	yes	no	Netherlands	2	SMART	Air search radar	2014	2017	1
UAE	yes	yes	France	17	Ground Master-200	Air search radar	2013	2015–2017	17
Kuwait	no	yes	Norway	10	Protector	Armoured personnel carrier turret	2014	2015	10
Kuwait	no	yes	Norway	218	Protector	Armoured personnel carrier turret	2016		
Kuwait	no	yes	United Kingdom	8	Thales ROTSS	Armoured personnel carrier turret	2017	2017	8
Jordan	no	yes	France	3	I-Master	AGS/MP radar	2014	2014–2017	3
Morocco	no	yes	France	2	Helios-2	Recce satellite	2013		2

## Thyssenkrupp

Recipient	Controversial country for arms exports	Country part of Saudi-led coalition in Yemen	Supplier	Number ordered	Weapon description	Weapon description	Year of order/ licence	Year(s) of deliveries	Number delivered/ produced	Comments
Egypt	yes	yes	Germany (FRG)	2	Type-209/1400	Submarine	2012	2016–2017	2	
Egypt	yes	yes	Germany (FRG)	2	Type-209/1400	Submarine	2014			Delivery planned by 2021
Turkey	yes	no	Germany	6	Type-214	Submarine	2011	2019–2024		

Table Shareholdings and bondholdings (in € millions)

	Airbus Group SE	BAE Systems	Boeing	General Dynamics	Leonardo	Lockheed Martin	Northrop Grumman Corp	Raytheon Co	Rheinmetall	Thales	ThyssenKrupp AG
Banco Santander	25.53		34.91		9.24		12.03	0.00	3.31	0.76	11.86
Barclays		823.33	373.19	66.53		190.96	83.65	97.05			
BBVA	27.97	0.00	4.14	5.54	0.11	6.00	6.00	3.09		0.33	0.24
BNP Paribas	445.45	2.29	276.00	35.15	2.87	22.34	43.72	47.59	0.01	162.59	43.83
Commerzbank	32.38	0.25	51.03	0.00	0.05	20.45	2.82	13.37	3.85	4.71	13.91
Credit Agricole	1,769.15	41.88	250.23	23.90	78.95	43.45	28.33	631.70	92.53	140.69	64.42
Credit Suisse	107.17	64.90	399.16	88.70	6.39	131.69	109.21	127.65	11.83	12.47	7.54
Deutsche Bank	569.04	220.43	805.94	110.65	7.29	180.20	118.20	418.46	26.81	51.08	107.19
Lloyds Bank	0.70		0.85								2.74
UniCredit	9.78				0.18	0.00					
<b>Grand Total</b>	<b>2,987.18</b>	<b>1,153.09</b>	<b>2,195.44</b>	<b>330.47</b>	<b>105.08</b>	<b>595.08</b>	<b>403.95</b>	<b>1,338.90</b>	<b>138.34</b>	<b>372.64</b>	<b>251.73</b>

Table Total deals (loans, bond underwritings and Equity issuances (in € millions)

	Airbus Group SE	BAE Systems	Boeing	General Dynamics	Leonardo	Lockheed Martin	Northrop Grumman Corp	Raytheon Co	Rheinmetall	Thales	ThyssenKrupp AG	Grand Total
Banco Santander			460.73		69.23					824.75	280.72	<b>1,635.43</b>
Barclays		329.83	560.05		69.23	98.67		57.99		100.32		<b>1,216.09</b>
BBVA	167.86		338.74	2,097.03	69.23						280.72	<b>2,953.58</b>
BNP Paribas	383.51	100.13	527.76		107.69	110.56	233.95	57.99		97.93	700.74	<b>2,320.26</b>
Commerzbank	143.56	100.13	299.91		107.69				227.25	97.93	740.54	<b>1,717.01</b>
Credit Agricole	311.42	100.13	392.10		107.69	1,235.85		57.99		922.68	280.72	<b>3,408.58</b>
Credit Suisse			213.40				635.22	57.99				<b>906.61</b>
Deutsche Bank	558.38	100.13	553.81		69.23		233.95	57.99			240.92	<b>1,814.41</b>
Lloyds Bank		100.13	338.17	2,353.91		911.90	425.88					<b>4,129.99</b>
UniCredit	342.73				107.69	581.68	2,797.15				280.72	<b>4,109.97</b>
<b>Grand Total</b>	<b>1,907.46</b>	<b>830.48</b>	<b>3,684.67</b>	<b>4,450.94</b>	<b>707.69</b>	<b>2,938.66</b>	<b>4,326.15</b>	<b>289.95</b>	<b>227.25</b>	<b>2,043.61</b>	<b>2,805.08</b>	<b>24,211.94</b>

**APPENDIX 3: FINANCIAL INSTITUTION DIVESTMENT FROM COMPANIES**

<b>Company</b>	<b>Reasons For Exclusion</b>	<b>Excluded From</b>	
Airbus	<ul style="list-style-type: none"> <li>→ Nuclear Weapons</li> <li>→ Defence contracts</li> </ul>	<ul style="list-style-type: none"> <li>→ ABP (Dutch Pension Fund)</li> <li>→ KLP</li> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ Delta Lloyd Asset Management</li> <li>→ PGGM</li> <li>→ PFZW</li> <li>→ PKA (Danish Pension Fund)</li> <li>→ Pensioenfond Horeca &amp; Catering (Netherlands)</li> <li>→ Danske Bank</li> <li>→ FDC</li> <li>→ SEB</li> <li>→ Spoorwegpensioenfond</li> </ul>	<ul style="list-style-type: none"> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> <li>→ PFA</li> <li>→ KBC (Belgian bank-insurance group)</li> <li>→ AP7 (Swedish Pension Fund)</li> <li>→ PKZH (Swiss Pension Fund)</li> <li>→ Achmea (Netherlands)</li> <li>→ Folksam (Swedish Insurance)</li> <li>→ TKP Investments</li> <li>→ Menzis</li> <li>→ Nordea</li> <li>→ NBIM</li> </ul>
BAE Systems	<ul style="list-style-type: none"> <li>→ Nuclear Weapons</li> <li>→ White Phosphorus</li> <li>→ Military-related Production</li> <li>→ Defence contracts</li> </ul>	<ul style="list-style-type: none"> <li>→ ABP (Dutch Pension Fund)</li> <li>→ KLP</li> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ PGGM</li> <li>→ PFZW</li> <li>→ PKA (Danish Pension Fund)</li> <li>→ Pensioenfond Horeca &amp; Catering (Netherlands)</li> <li>→ FDC</li> <li>→ PME</li> <li>→ SEB</li> <li>→ Schrodgers</li> <li>→ Spoorwegpensioenfond</li> <li>→ BPMT (Dutch Pension Fund)</li> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> </ul>	<ul style="list-style-type: none"> <li>→ Folio Investing</li> <li>→ PFA</li> <li>→ Presbyterian Church USA</li> <li>→ KBC (Belgian bank-insurance group)</li> <li>→ AP7 (Swedish Pension Fund)</li> <li>→ PKZH (Swiss Pension Fund)</li> <li>→ Achmea (Netherlands)</li> <li>→ Folksam (Swedish Insurance)</li> <li>→ TKP Investments</li> <li>→ MN Huisfondsen (Netherlands)</li> <li>→ Menzis</li> <li>→ Nordea</li> <li>→ NBIM</li> </ul>
Boeing	<ul style="list-style-type: none"> <li>→ Nuclear Weapons</li> <li>→ Military-related Production</li> <li>→ Defence contracts</li> </ul>	<ul style="list-style-type: none"> <li>→ ABP (Dutch Pension Fund)</li> <li>→ KLP</li> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ Delta Lloyd Asset Management</li> <li>→ PGGM</li> <li>→ PFZW</li> <li>→ PKA (Danish Pension Fund)</li> <li>→ Pensioenfond Horeca &amp; Catering (Netherlands)</li> <li>→ FDC</li> <li>→ SEB</li> <li>→ Spoorwegpensioenfond</li> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> </ul>	<ul style="list-style-type: none"> <li>→ Folio Investing</li> <li>→ PFA</li> <li>→ Presbyterian Church USA</li> <li>→ KBC (Belgian bank-insurance group)</li> <li>→ AP7 (Swedish Pension Fund)</li> <li>→ PKZH (Swiss Pension Fund)</li> <li>→ Achmea (Netherlands)</li> <li>→ Folksam (Swedish Insurance)</li> <li>→ TKP Investments</li> <li>→ Menzis</li> <li>→ Nordea</li> <li>→ NBIM</li> </ul>
General Dynamics	<ul style="list-style-type: none"> <li>→ Nuclear Weapons</li> <li>→ Controversial Weapons</li> <li>→ Failure to guarantee that they will not produce cluster weapons in the future</li> <li>→ Munitions with depleted uranium</li> <li>→ Anti-Personnel mines</li> <li>→ White Phosphorus</li> <li>→ Producer of weapons in breach of Oslo and Ottawa Conventions</li> <li>→ Military-related Production</li> <li>→ Defence contracts</li> </ul>	<ul style="list-style-type: none"> <li>→ ABP (Dutch Pension Fund)</li> <li>→ Aegon</li> <li>→ KLP</li> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ Delta Lloyd Asset Management</li> <li>→ PGGM</li> <li>→ PFZW</li> <li>→ PKA (Danish Pension Fund)</li> <li>→ Pensioenfond Horeca &amp; Catering (Netherlands)</li> <li>→ Nykredit (Denmark)</li> <li>→ Danske Bank</li> <li>→ FDC</li> <li>→ PME</li> <li>→ SEB</li> <li>→ Spoorwegpensioenfond</li> <li>→ BPMT (Dutch Pension Fund)</li> </ul>	<ul style="list-style-type: none"> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> <li>→ Fonds de Reserve (French)</li> <li>→ Folio Investing</li> <li>→ PFA</li> <li>→ Presbyterian Church USA</li> <li>→ KBC (Belgian bank-insurance group)</li> <li>→ PKZH (Swiss Pension Fund)</li> <li>→ Achmea (Netherlands)</li> <li>→ Folksam (Swedish Insurance)</li> <li>→ TKP Investments</li> <li>→ MN Huisfondsen (Netherlands)</li> <li>→ Menzis</li> <li>→ Nordea</li> <li>→ Fonds de Réserve pour les Retraites (France)</li> <li>→ NBIM</li> </ul>
Leonardo	<ul style="list-style-type: none"> <li>→ Nuclear Weapons</li> <li>→ Involvement in serious corruption cases</li> <li>→ Human Rights (violations)</li> <li>→ Military-related Production</li> <li>→ Defence contracts</li> </ul>	<ul style="list-style-type: none"> <li>→ ABP (Dutch Pension Fund)</li> <li>→ KLP</li> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ Delta Lloyd Asset Management</li> <li>→ PGGM</li> <li>→ PFZW</li> <li>→ Pensioenfond Horeca &amp; Catering (Netherlands)</li> <li>→ FDC</li> <li>→ SEB</li> <li>→ Spoorwegpensioenfond</li> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> </ul>	<ul style="list-style-type: none"> <li>→ PFA</li> <li>→ Presbyterian Church USA</li> <li>→ KBC (Belgian bank-insurance group)</li> <li>→ AP7 (Swedish Pension Fund)</li> <li>→ PKZH (Swiss Pension Fund)</li> <li>→ Achmea (Netherlands)</li> <li>→ Folksam (Swedish Insurance)</li> <li>→ TKP Investments</li> <li>→ Menzis</li> <li>→ Nordea</li> <li>→ NBIM</li> </ul>

Lockheed Martin	<ul style="list-style-type: none"> <li>→ Nuclear Weapons</li> <li>→ Producer of weapons in breach of Oslo and Ottawa Conventions</li> <li>→ Anti-personnel mines</li> <li>→ Military-related Production</li> <li>→ Defence contracts</li> </ul>	<ul style="list-style-type: none"> <li>→ ABP (Dutch Pension Fund)</li> <li>→ KLP</li> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ Delta Lloyd Asset Management</li> <li>→ PGGM</li> <li>→ PFZW</li> <li>→ PKA (Danish Pension Fund)</li> <li>→ Pensioenfond Horeca &amp; Catering (Netherlands)</li> <li>→ Nykredit (Denmark)</li> <li>→ Danske Bank</li> <li>→ FDC</li> <li>→ SEB</li> <li>→ Schroders</li> <li>→ Spoorwegpensioenfond</li> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> </ul>	<ul style="list-style-type: none"> <li>→ Fonds de Reserve (French)</li> <li>→ Folio Investing</li> <li>→ PFA</li> <li>→ Presbyterian Church USA</li> <li>→ KBC (Belgian bank-insurance group)</li> <li>→ AP7 (Swedish Pension Fund)</li> <li>→ PKZH (Swiss Pension Fund)</li> <li>→ Achmea (Netherlands)</li> <li>→ Folksam (Swedish Insurance)</li> <li>→ TKP Investments</li> <li>→ Menzis</li> <li>→ Nordea</li> <li>→ Fonds de Réserve pour les Retraites (France)</li> <li>→ NBIM</li> </ul>
-----------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

#### MBDA

Northrop Grumman	<ul style="list-style-type: none"> <li>→ Nuclear Weapons</li> <li>→ Controversial Weapons</li> <li>→ Depleted Uranium</li> <li>→ Cluster munitions</li> <li>→ Military-related production</li> <li>→ Defence contracts</li> </ul>	<ul style="list-style-type: none"> <li>→ ABP (Dutch Pension Fund)</li> <li>→ Aegon</li> <li>→ KLP</li> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ Delta Lloyd Asset Management</li> <li>→ PGGM</li> <li>→ PFZW</li> <li>→ PKA (Danish Pension Fund)</li> <li>→ Pensioenfond Horeca &amp; Catering (Netherlands)</li> <li>→ Danske Bank</li> <li>→ FDC</li> <li>→ SEB</li> <li>→ Spoorwegpensioenfond</li> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> </ul>	<ul style="list-style-type: none"> <li>→ Fonds de Reserve (French)</li> <li>→ Folio Investing</li> <li>→ PFA</li> <li>→ Presbyterian Church USA</li> <li>→ KBC (Belgian bank-insurance group)</li> <li>→ AP7 (Swedish Pension Fund)</li> <li>→ PKZH (Swiss Pension Fund)</li> <li>→ Achmea (Netherlands)</li> <li>→ Folksam (Swedish Insurance)</li> <li>→ TKP Investments</li> <li>→ Menzis</li> <li>→ Nordea</li> <li>→ Fonds de Réserve pour les Retraites (France)</li> <li>→ NBIM</li> </ul>
------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Raytheon	<ul style="list-style-type: none"> <li>→ Nuclear Weapons</li> <li>→ Cluster Weapons</li> <li>→ Military-related production</li> <li>→ Defense contracts</li> </ul>	<ul style="list-style-type: none"> <li>→ ABP (Dutch Pension Fund)</li> <li>→ KLP</li> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ Delta Lloyd Asset Management</li> <li>→ PGGM</li> <li>→ PFZW</li> <li>→ PKA (Danish Pension Fund)</li> <li>→ Pensioenfond Horeca &amp; Catering (Netherlands)</li> <li>→ ATP</li> <li>→ FDC</li> <li>→ SEB</li> <li>→ Spoorwegpensioenfond</li> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> </ul>	<ul style="list-style-type: none"> <li>→ Fonds de Reserve (French)</li> <li>→ Folio Investing</li> <li>→ PFA</li> <li>→ Presbyterian Church USA</li> <li>→ KBC (Belgian bank-insurance group)</li> <li>→ AP7 (Swedish Pension Fund)</li> <li>→ PKZH (Swiss Pension Fund)</li> <li>→ Achmea (Netherlands)</li> <li>→ Folksam (Swedish Insurance)</li> <li>→ TKP Investments</li> <li>→ Menzis</li> <li>→ Nordea</li> <li>→ Fonds de Réserve pour les Retraites (France)</li> </ul>
----------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Rheinmetall	<ul style="list-style-type: none"> <li>→ Involvement with manufactures of biological, chemical or nuclear weapons</li> <li>→ White Phosphorus</li> </ul>	<ul style="list-style-type: none"> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> <li>→ KBC (Belgian bank-insurance group)</li> </ul>	
-------------	----------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Thales	<ul style="list-style-type: none"> <li>→ Nuclear Weapons</li> <li>→ White Phosphorus</li> <li>→ Military-related production</li> <li>→ Defense contracts</li> </ul>	<ul style="list-style-type: none"> <li>→ ABP (Dutch Pension Fund)</li> <li>→ Pension Funds PNO Media (Netherlands)</li> <li>→ Delta Lloyd Asset Management</li> <li>→ PGGM</li> <li>→ PFZW</li> <li>→ PKA (Danish Pension Fund)</li> <li>→ Pensioenfond Horeca &amp; Catering (Netherlands)</li> <li>→ PME</li> <li>→ SEB</li> <li>→ Spoorwegpensioenfond</li> <li>→ BPMT (Dutch Pension Fund)</li> </ul>	<ul style="list-style-type: none"> <li>→ SPOV Stichting Pensioenfond Openbaar Vervoer</li> <li>→ Presbyterian Church USA</li> <li>→ KBC (Belgian bank-insurance group)</li> <li>→ AP7 (Swedish Pension Fund)</li> <li>→ PKZH (Swiss Pension Fund)</li> <li>→ Achmea (Netherlands)</li> <li>→ TKP Investments</li> <li>→ MN Huisfondsen (Netherlands)</li> <li>→ Menzis</li> <li>→ Nordea</li> </ul>
--------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

#### ThyssenKrupp

#### Triodos

Triodos Bank excludes all companies involved in arms-related activities.

#### New Zealand Superannuation Fund

Exclude companies directly manufacturing cluster weapons, the manufacture or testing of nuclear explosive devices, manufacturing of anti-personnel mines



## Heading Towards Autonomy? A Potential Watchlist

The below list is an indicative list of some of the companies developing unmanned systems for military applications. These companies are developing weapons with autonomous features or with some level of autonomy or automation in their products. This list is not exhaustive.

- AeroVironment Inc
- Airbus SE
- Alenia Aeronautica (subsidiary of Leonardo)
- BAE Systems Plc
- Boeing Co
- China Aerospace Science and Technology Corporation
- Cobham plc
- Dassault Aviation
- Dassault Systemes SA
- Defence Electronics Application Laboratory
- Elbit Systems Ltd
- FN Herstal
- Foster-Miller (subsidiary of QinetiQ Group Plc)
- G-NIUS Ltd
- General Atomics Aeronautical Systems, Inc.  
(and parent General Atomics)
- GIWS (owned by Diehl and Rheinmetall)
- General Dynamics Corp
- Hanwha Techwin
- IAI (Israel Aerospace Industries Ltd)
- Kongsberg Defence & Aerospace (subsidiary of Kongsberg Group)
- Leonardo SpA
- Lockheed Martin Corp
- MBDA (private company)
- NEXTER Group
- Milrem Robotics
- Northrop Grumman Corp
- Oshkosh Corp
- QinetiQ Group Plc
- RUAG Holding AG
- Rafael Advanced Defense Systems Ltd.
- Raytheon Co
- Rheinmetall AG
- Rolls-Royce plc
- Rosoboronexport
- Russian Aircraft Corporation MiG
- SEEGRID Corporation
- STM Savunma Teknolojileri Mühendislik ve Ticaret A.Ş.
- Saab AB B
- Textron Inc
- Thales
- Turkish Aerospace Industries, Inc. (TAI)
- JSC Kalashnikov Concern
- WB Electronics
- DoDaam Systems Ltd

APPENDIX 5: ASSESSMENT FOR MIDDLE EAST AND NORTH AFRICA (MENA) REGION COUNTRIES

<b>Arms embargo</b>		<b>Armed conflict</b>	<b>Unfree country</b>	<b>Corruption</b>	<b>Fragile states</b>
Source:**		Uppsala Database 2018 and Global Peace Index 2018 by Vision of Humanity.	Freedom House Index 2018 and Democracy Index Data 2017	Transparency International Corruption in Defence Index 2015	Fragile States Index 2018 (The Fund for Peace)
Azerbaijan			Unfree Authoritarian regime	Corruption	
Bahrain		Armed Conflict	Unfree Authoritarian regime	Corruption	
Egypt	EU arms embargo	Armed Conflict		Corruption	
Iran	EU and UN arms embargo	Armed Conflict		Corruption	
Iraq	EU and UN arms embargo	Armed Conflict		Corruption	Fragile State
Lebanon		Armed Conflict		Corruption	
Libya	EU and UN arms embargo	Armed Conflict	Unfree Authoritarian Regime	Corruption	Fragile State
Mauritania		Armed Conflict		Corruption	Fragile State
Saudi Arabia		Armed Conflict	Unfree Authoritarian Regime	Corruption	
Somalia	EU and UN arms embargo	Armed Conflict	Unfree Authoritarian Regime	Corruption	Fragile State
Sudan	EU and UN arms embargo	Armed Conflict	Unfree Authoritarian Regime	Corruption	Fragile State
South Sudan	EU arms embargo	Armed Conflict	No data	Corruption	Fragile State
Syria	EU arms embargo	Armed Conflict	Unfree Authoritarian Regime	Corruption	Fragile State
Turkey		Armed Conflict			
UAE			Unfree Authoritarian Regime	Corruption	
Yemen	UN and EU arms embargo	Armed conflict	Unfree Authoritarian Regime	Corruption	Fragile State

\*\* Note (final category is poverty and military spending this applies to none of the MENA region countries)

# Endnotes

- SIPRI (2019): 5 charts that reveal the state of the global arms trade. 14 March. World Economic Forum. <https://www.weforum.org/agenda/2019/03/5-charts-that-reveal-the-state-of-the-global-arms-trade/>
- Mwatana for Human Rights (2019): Four Years into Saudi/Emirati-Led Coalition Yemen Campaign. 26 March. <http://mwatana.org/en/four-years-of-war/>
- Killer Roboter Stoppen (2018): Antonio Guterres CEO der Vereinten Nationen fordert verbot von Autonomen Waffen. <http://www.killer-roboter-stoppen.de/2018/11/antonio-guterres-ceo-der-vereinten-nationen-fordert-verbot-von-autonomen-waffen/>
- Dagonborg, J and Fouche G (2016): EXCLUSIVE-Norway wealth fund's ethics watchdog warns firms not to make killer robots. Reuters. 11 March. <https://www.reuters.com/article/norway-swf-arms-idUSL5N16H3AQ>
- Brudge, D (2019): Raytheon wins \$1.5bn deal for UAE missile launching system. Arabian Business. 18 Feb. <https://www.arabianbusiness.com/technology/413516-raytheon-wins-15bn-deal-for-uae-missile-launching-system>
- SIPRI (2018): Trends in international arms transfers 2017. [https://www.sipri.org/sites/default/files/2018-03/fssipri\\_at2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-03/fssipri_at2017_0.pdf)
- Qiblawi, T (2019): 'Global indifference' contributing to Middle East crackdowns, Amnesty says. CNN. 26 Feb. <https://edition.cnn.com/2019/02/26/middleeast/middle-east-report-2018-amnesty-int/index.html>
- ECCHR (2018): The impact of Germany's arms transfers on economic, social and cultural rights Extraterritorial Obligations under the International Covenant on Economic, Social and Cultural Rights [https://tbinternet.ohchr.org/Treaties/CESCR/Shared%20Documents/DEU/INT\\_CESCR\\_CSS\\_DEU\\_32288\\_E.pdf](https://tbinternet.ohchr.org/Treaties/CESCR/Shared%20Documents/DEU/INT_CESCR_CSS_DEU_32288_E.pdf)
- PAX for Peace (2015): Case study: Controversial Arms Trade. 18 June. <https://www.paxforpeace.nl/publications/all-publications/case-study-controversial-arms-trade>
- UN High Commissioner for Human Rights (2017): OHCHR response to request from BankTrack for advice regarding the application of the UN Guiding Principles on Business and Human Rights in the context of the banking sector. June 2017 <https://www.ohchr.org/Documents/Issues/Business/InterpretationGuidingPrinciples.pdf>
- UN High Commissioner for Human Rights (2017): OHCHR response to request from BankTrack for advice regarding the application of the UN Guiding Principles on Business and Human Rights in the context of the banking sector. June 2017 <https://www.ohchr.org/Documents/Issues/Business/InterpretationGuidingPrinciples.pdf>
- UN High Commissioner for Human Rights (2017): OHCHR response to request from BankTrack for advice regarding the application of the UN Guiding Principles on Business and Human Rights in the context of the banking sector. June 2017 <https://www.ohchr.org/Documents/Issues/Business/InterpretationGuidingPrinciples.pdf>
- Eurostat (2019): Asylum statistics. 12 Mar. [https://ec.europa.eu/eurostat/statistics-explained/index.php/Asylum\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php/Asylum_statistics) (Accessed 13.04.2019)
- SIPRI (2018): Saudi Arabia, armaments and conflict in the Middle East. 14 Dec. <https://www.sipri.org/> (Accessed 12.04.2019)
- International Crisis Group (2019): Crisis Group Yemen Update #3. 8 Feb. <https://www.crisisgroup.org/> (Accessed 12.04.2019) and Clingendael (2018): International arms flows: monitoring, sources and obstacles. 7 Jan. <https://www.clingendael.org/> (Accessed 10.04.2019)
- CAAT (2018) An introduction to the arms trade. 7 Jul. <https://www.caat.org.uk/> (Accessed 13.04.2019)
- NHCR Refugee Situations (2019): Yemen. 19 Feb. <https://data2.unhcr.org/en/country/yem> (Accessed 13.04.2019)
- UNHCR: Internally Displaced People. <https://www.unhcr.org/> (Accessed 14.04.2019)
- UNHCR Refugee Situations (2019): Syria Regional Refugee Response. 09 Apr. <https://data2.unhcr.org/en/situations/syria>
- ICRC (2018): Autonomous Weapon Systems under International Humanitarian law. <https://www.icrc.org/en/document/autonomous-weapon-systems-under-international-humanitarian-law>
- Meeting of the High Contracting Parties to the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects. Geneva, 21-23 November 2018 Item 8 of the provisional agenda Consideration of the report of the Group of Governmental Experts on lethal autonomous weapons. [https://www.unog.ch/80256EDD006B8954/\(httpAs-sets\)/810B2543E1B5283BC125834A005E-F8E3/\\$file/CCW\\_MSP\\_2018\\_WP3.pdf](https://www.unog.ch/80256EDD006B8954/(httpAs-sets)/810B2543E1B5283BC125834A005E-F8E3/$file/CCW_MSP_2018_WP3.pdf)
- Bode, I., & Huels, H. (2018). Autonomous weapons systems and changing norms in international relations. *Review of International Studies*, 44(3), 393-413. doi:10.1017/S0260210517000614 <https://www.cambridge.org/core/journals/review-of-international-studies/article/autonomous-weapons-systems-and-changing-norms-in-international-relations/8E8CC29419AF2EF403EA02ACACFCF223>
- Bradley, S (2018): Huge drop revealed in cluster munitions investments. *Swissinfo.ch*. [https://www.swissinfo.ch/eng/-don-t-bank-on-the-bomb-\\_report-reveals-huge-drop-in-cluster-munitions-investments/44590536](https://www.swissinfo.ch/eng/-don-t-bank-on-the-bomb-_report-reveals-huge-drop-in-cluster-munitions-investments/44590536)
- UN Human Rights Office of the High Commissioner (2012): THE CORPORATE RESPONSIBILITY TO RESPECT HUMAN RIGHTS: an interpretive guide. [https://www.ohchr.org/Documents/Publications/HR.PUB.12.2\\_En.pdf](https://www.ohchr.org/Documents/Publications/HR.PUB.12.2_En.pdf)
- SIPRI (2018): The top 100 arms-producing and military services companies, 2017 [https://www.sipri.org/sites/default/files/2018-12/fs\\_arms\\_industry\\_2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-12/fs_arms_industry_2017_0.pdf)
- Lockheed Martin, Boeing, Raytheon, BAE Systems (and BAE UK), Northrop Grumman, General Dynamics Corp, Airbus Group, Leonardo, Thales. We will also cover MDBA (joint company involving Airbus, BAE and Leonardo)
- Rheinmetall and ThyssenKrupp
- PAX (2015): Case Study: Controversial Arms Trade <https://www.paxforpeace.nl/publications/all-publications/case-study-controversial-arms-trade>
- <http://www.reachingcriticalwill.org/images/documents/Publications/wilpf-guide-aws.pdf>
- Bode, I., & Huels, H. (2018). Autonomous weapons systems and changing norms in international relations. *Review of International Studies*, 44(3), 393-413. doi:10.1017/S0260210517000614 <https://www.cambridge.org/core/journals/review-of-international-studies/article/autonomous-weapons-systems-and-changing-norms-in-international-relations/8E8CC29419AF2EF403EA02ACACFCF223>
- Freedom House (2019): Freedom in the World index 2018 Azerbaijan <https://freedomhouse.org/report/freedom-world/2018/azerbaijan>
- "Bahraini forces critically wound protester with live ammunition in attack on Diraz protests," Americans for Democracy and Human Rights in Bahrain, 26 January 2017, accessed 27 January 2017, <http://www.adhrb.org/2017/01/11665/>.
- SIPRI (2018): Arms embargo on Egypt [https://www.sipri.org/databases/embargoes/eu\\_arms\\_embargoes/egypt/eu-arms-embargo-on-egypt](https://www.sipri.org/databases/embargoes/eu_arms_embargoes/egypt/eu-arms-embargo-on-egypt)
- Uppsala Conflict Data Program 2018: Egypt <http://www.ucdp.uu.se/#country/651>
- The Tahir Institute for Middle east policy (2017): Leaked Video of Extrajudicial Killings Connected to Military. <https://timep.org/ewj/reports-briefs/leaked-video-of-extrajudicial-killings-connected-to-military/>
- SIPRI (2018): Arms embargo on Iran [https://www.sipri.org/databases/embargoes/un\\_arms\\_embargoes/iran](https://www.sipri.org/databases/embargoes/un_arms_embargoes/iran)
- SIPRI (2018): Arms embargo on Iran [https://www.sipri.org/databases/embargoes/eu\\_arms\\_embargoes/iran](https://www.sipri.org/databases/embargoes/eu_arms_embargoes/iran)
- Uppsala Conflict Data Program 2018: Iran <http://www.ucdp.uu.se/#country/630>
- SIPRI (2018): Arms embargo on Lebanon [https://www.sipri.org/databases/embargoes/un\\_arms\\_embargoes/lebanon](https://www.sipri.org/databases/embargoes/un_arms_embargoes/lebanon)
- Uppsala Conflict Data Program 2018: Lebanon <http://www.ucdp.uu.se/#country/660>
- SIPRI (2018): Arms embargo on Libya [https://www.sipri.org/databases/embargoes/un\\_arms\\_embargoes/libya/libya\\_2011](https://www.sipri.org/databases/embargoes/un_arms_embargoes/libya/libya_2011)
- Uppsala Conflict Data Program 2018: Libya <http://www.ucdp.uu.se/#country/620>
- Freedom House (2019): Freedom in the World index 2018 Libya <https://freedomhouse.org/report/freedom-world/2018/libya>
- Uppsala Conflict Data Program 2018: Mauritania <http://www.ucdp.uu.se/#country/435>
- Uppsala Conflict Data Program 2018: Government of Yemen <http://www.ucdp.uu.se/#statebased/14595>
- Freedom House (2019): Freedom in the World index 2018 Saudi Arabia <https://freedomhouse.org/report/freedom-world/2018/saudi-arabia>
- SIPRI (2018): Arms embargo on Somalia. [https://www.sipri.org/databases/embargoes/un\\_arms\\_embargoes/somalia](https://www.sipri.org/databases/embargoes/un_arms_embargoes/somalia)
- SIPRI (2018): Arms embargo on Somalia. [https://www.sipri.org/databases/embargoes/eu\\_arms\\_embargoes/somalia](https://www.sipri.org/databases/embargoes/eu_arms_embargoes/somalia)
- Uppsala Conflict Data Program 2018: Somalia <http://www.ucdp.uu.se/#country/520>
- Freedom House (2019): Freedom in the World index 2018 Somalia <https://freedomhouse.org/report/freedom-world/2018/somalia>
- Freedom House (2019): Freedom in the World index 2018 Sudan <https://freedomhouse.org/report/freedom-world/2018/sudan>
- SIPRI (2018): Arms embargo on Sudan [https://www.sipri.org/databases/embargoes/un\\_arms\\_embargoes/sudan](https://www.sipri.org/databases/embargoes/un_arms_embargoes/sudan)
- SIPRI (2018): Arms embargo on Sudan [https://www.sipri.org/databases/embargoes/eu\\_arms\\_embargoes/sudan](https://www.sipri.org/databases/embargoes/eu_arms_embargoes/sudan)
- Uppsala Conflict Data Program 2018: South Sudan and Sudan <http://www.ucdp.uu.se/#country/626> and <http://www.ucdp.uu.se/#country/625>
- SIPRI (2018): Arms embargo on Syria. [https://www.sipri.org/databases/embargoes/eu\\_arms\\_embargoes/syria\\_LAS/eu-embargo-on-syria](https://www.sipri.org/databases/embargoes/eu_arms_embargoes/syria_LAS/eu-embargo-on-syria)
- Uppsala Conflict Data Program 2018: Syria <http://www.ucdp.uu.se/#country/652>
- Freedom House (2019): Freedom in the World index 2018 Syria <https://freedomhouse.org/report/freedom-world/2018/syria>
- Freedom House (2019): Freedom in the World index 2018 UAE <https://freedomhouse.org/report/freedom-world/2018/united-arab-emirates>
- SIPRI (2019): EU arms embargo on Yemen. [https://www.sipri.org/databases/embargoes/eu\\_arms\\_embargoes/yemen/eu-arms-embargo-on-yemen](https://www.sipri.org/databases/embargoes/eu_arms_embargoes/yemen/eu-arms-embargo-on-yemen)
- Uppsala Conflict Data Program 2018: North Yemen <http://www.ucdp.uu.se/#country/678>
- Uppsala Conflict Data Program 2018: Turkey <http://www.ucdp.uu.se/#country/640>
- Pearson, A (2019): Syria conflict: What do the US, Russia, Turkey and Iran want? *Deutsche Welle*. 23 Jan. <https://www.dw.com/en/syria-conflict-what-do-the-us-russia-turkey-and-iran-want/a-41211604>
- Human Rights Watch (2018): Syria: Turkey-Backed Groups Seizing Property. 14 June. <https://www.hrw.org/news/2018/06/14/syria-turkey-backed-groups-seizing-property>
- Airbus (2019): Defense and Security <https://www.airbus.com/defence.html>
- Sipri (2018): The Sipri top 100 arms-producing and military services companies, 2017 (Accessed 7.3.19) [https://www.sipri.org/sites/default/files/2018-12/fs\\_arms\\_industry\\_2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-12/fs_arms_industry_2017_0.pdf)
- Airbus (n.d.): Contributing to a safer and more prosperous world (Accessed 7.3.19) <https://www.airbus.com/company/responsibility-sustainability/contributing-to-a-safer-and-more-prosperous-world.html>
- Airbus (n.d.): C295 The most versatile and Tactical Transport aircraft (Accessed 7.3.19) <https://www.airbus.com/defence/c295.html> and Airbus (n.d.): A400M Delivery to the point of need (Accessed 7.3.19) <https://www.airbus.com/defence/a400m.html>
- HRW (April 23, 2018): Egypt: Looming humanitarian crisis in Sinai (Accessed 7.3.19) <https://www.hrw.org/news/2018/04/23/egypt-looming-humanitarian-crisis-sinai>
- Gunters Space Page (last updated on 11.12.17): Helios 2A, 2B (Accessed 7.3.19) [https://space.skyrocket.de/doc\\_sdat/helios-2a.htm](https://space.skyrocket.de/doc_sdat/helios-2a.htm)
- France24 (10.11.17): Saudi-led coalition ends US refueling deal in war with Yemen (Accessed 7.3.19) <https://www.france24.com/en/20181110-saudi-led-coalition-ends-us-refueling-deal-war-with-yemen>
- PAX (n.d.) Dont Bank on the Bomb Nuclear Weapon Producers (Accessed 7.3.19) <https://www.dontbankonthebomb.com/nuclear-weapon-producers/>
- Irving Lachow (2017) The upside and downside of swarming drones, *Bulletin of the Atomic Scientists*, 73:2, 96-101 (Accessed 7.3.19) <https://www.tandfonline.com/doi/pdf/10.1080/00963402.2017.1290879>
- William Kucinski (31.10.19) New Zealand will become a testbed for Airbus unmanned aircraft and space technology (Accessed 7.3.19) <https://www.sae.org/news/2018/10/new-zealand-will-become-a-testbed-for-airbus-unmanned-aircraft-and-space-technology>
- Matthias Hoening and Carsten Hoffman (8.10.18) Airbus testet Drohnen über Ostsee (Accessed 7.3.19) <http://www.ostsee-zeitung.de/Nachrichten/MV-aktuell/Airbus-testet-Drohnen-ueber-Ostsee>
- Irving Lachow (2017) The upside and downside of swarming drones, *Bulletin of the Atomic Scientists*, 73:2, 96-101 (Accessed 7.3.19) <https://www.tandfonline.com/doi/pdf/10.1080/00963402.2017.1290879>
- Stoney Trent and Scott Lathrop (n.d.) A Primer on Artificial Intelligence for Military Leaders (Accessed 7.3.19) <https://smallwarsjournal.com/jrnl/art/primer-artificial-intelligence-military-leaders>
- Airbus (2019): Future Airpower. <https://www.airbus.com/newsroom/news/en/2018/04/future-of-air-power.html>
- Europäischer Sicherheit und Technik (2019): IDEX: Anti-tank UGV presented with MMP anti tank systems. <https://esut.de/en/2019/02/meldungen/land/10739/idx-panzer-abwehr-ugv-mit-mmp-panzerabwehrsystemen-vorgestellt/>
- defenceWeb (19.2.19): MBDA and Milrem Robotics unveil anti-tank UGV. *Defence Web*. (Accessed 14.3.19) <https://www.defenceweb.co.za/joint/science-a-defence-technology/mbda-and-milrem-robotics-unveil-anti-tank-ugv/>
- MBDA (nd): Product MMP. <https://www.mbda-systems.com/product/mmp/>
- Kelsey D. Atherton (15.11.18): Are Killer Robots the Future of War? Parsing the Facts on Autonomous Weapons. *The New York Times*. (Accessed 14.3.19) <https://www.nytimes.com/2018/11/15/magazine/autonomous-robots-weapons.html>
- SIPRI (2018): The SIPRI top 100 arms-producing and military services companies, 2017 (Accessed 7.3.19) [https://www.sipri.org/sites/default/files/2018-12/fs\\_arms\\_industry\\_2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-12/fs_arms_industry_2017_0.pdf)
- BAE Systems (2018): Annual Report 2017. [http://www.annualreports.com/HostedData/AnnualReports/PDF/LSE\\_BA\\_2017.pdf](http://www.annualreports.com/HostedData/AnnualReports/PDF/LSE_BA_2017.pdf)
- Financial Times (2010): BAE to pay \$450m to end bribery case. <https://www.ft.com/content/8134d35a-126a-11df-8d73-00144feab49a>
- World Peace Foundation (n.d.) The Al Yamamah Arms Deals- Compendium of Arms Trade Corruption (Accessed 7.3.19) <https://sites.tufts.edu/corruptarmsdeals/the-al-yamamah-arms-deals/>
- Campaign Against Arms Trade (last updated on 11.2.18): Target Saudi's arms suppliers (Accessed 7.3.19) <https://www.caat.org.uk/campaigns/stop-arming-saudi/companies>
- Freedom House (n.d.): Freedom in the World 2018 Saudi Arabia profile (Accessed 7.3.19) <https://freedomhouse.org/report/freedom-world/2018/saudi-arabia>
- BAE Systems (n.d.) Hawk Advanced Jet Trainer (Accessed 7.3.19) <https://www.baesystems.com/en/product/hawk-ajt>
- Agnes Helou (20.2.18): Trainer jet market flourishes in the Middle East (Accessed 7.3.19) <https://www.defensenews.com/training-sim/2018/02/20/trainer-jet-market-flourishes-in-the-middle-east/>
- BAE Systems (n.d.): Regulations and external controls (Accessed 7.3.19) [https://www.baesystems.com/cs/ContentServer?packageName=WEBROOTNAME%3Den\\_uk&=BAEdefaultPageCnt\\_C&childPageName=UK%2FBAE-Layout&rendermode=preview&packageName=UK-Wrapper&cid=1434554703868](https://www.baesystems.com/cs/ContentServer?packageName=WEBROOTNAME%3Den_uk&=BAEdefaultPageCnt_C&childPageName=UK%2FBAE-Layout&rendermode=preview&packageName=UK-Wrapper&cid=1434554703868)
- Boulanin/Verbruggen 2017: Mapping Autonomy in Weapons systems (page 48-50) [https://www.sipri.org/sites/default/files/2017-11/sipriport\\_mapping\\_the\\_development\\_of\\_autonomy\\_in\\_weapon\\_systems\\_1117\\_1.pdf](https://www.sipri.org/sites/default/files/2017-11/sipriport_mapping_the_development_of_autonomy_in_weapon_systems_1117_1.pdf)

92 PAX (n.d.): Dont Bank on the Bomb Nuclear Weapon Producers (Accessed 7.3.19) <https://www.dontbankonthebomb.com/nuclear-weapon-producers/>

93 Jon Cartwright (21.11.10): Rise of the robots and the future of war. The Guardian. (Accessed 7.3.19) <https://www.theguardian.com/technology/2010/nov/21/military-robots-autonomous-machines>

94 Drone Wars UK (n.d.): Report (Accessed 7.3.19) [https://regmedia.co.uk/2018/11/12/drone\\_wars\\_uk\\_off\\_the\\_leash\\_report.pdf](https://regmedia.co.uk/2018/11/12/drone_wars_uk_off_the_leash_report.pdf)

95 Trevithick, J (2018) The U.K.'s New 'Tempest' Stealth Fighter Project Already Faces Serious Challenges. The Drive. <http://www.thedrive.com/the-war-zone/22190/the-u-k-s-new-tempest-stealth-fighter-project-already-faces-serious-challenges>

96 BAE Systems (3.10.18): Black Night unveiled (Accessed 7.3.19) <https://www.baesystems.com/en/black-night-unveiled>

97 Boeing (31.1.18): Boeing Reports Record 2017 Results and Provides 2018 Guidance (Accessed 7.3.19) <http://investors.boeing.com/investors/investor-news/press-release-details/2018/Boeing-Reports-Record-2017-Results-and-Provides-2018-Guidance/default.aspx>

98 SIPRI (2018): The SIPRI top 100 arms-producing and military services companies, 2017 (Accessed 7.3.19) [https://www.sipri.org/sites/default/files/2018-12/fs\\_arms\\_industry\\_2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-12/fs_arms_industry_2017_0.pdf)

99 Boeing (n.d.): Boeing Defense, Space and Security in the Middle East (Accessed 7.3.19) <https://www.boeing-me.com/en/boeing-in-the-middle-east/about-boeing-in-the-middle-east/defense-space-and-security.page?>

100 Monthly Human Rights Digest (June 2018): Between a Rock and a Hard Place – Civilians in North-western Syria (Accessed 7.3.19) [https://reliefweb.int/sites/reliefweb.int/files/resources/ohchr\\_-\\_syria\\_monthly\\_human\\_rights\\_digest\\_-\\_june\\_2018.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/ohchr_-_syria_monthly_human_rights_digest_-_june_2018.pdf)

101 MAREX (30.3.15): Egypt Initiates Naval Attacks in Yemen. The Maritime Executive (Accessed 7.3.19) <https://maritime-executive.com/article/egypt-initiates-naval-attacks-in-yemen>

102 Military Edge (2019): RGM-84L Harpoon II (Accessed 7.3.19) <https://militaryedge.org/armaments/rgm-84l-harpoon/>

103 Derek Bisaccio (11.4.18): SLAM-ER for Saudi Arabia. Defense and Security Monitor (Accessed 7.3.19) <https://dsm.forecastinternational.com/wordpress/2018/04/11/slam-er-for-saudi-arabia/>

104 Military Watch (23.3.18): Another F-15SA Lost to Yemeni Air Defenses (Accessed 7.3.19) <https://militarywatchmagazine.com/article/another-f-15sa-lost-to-yemeni-air-defences-is-saudi-s-war-damaging-the-prestige-of-western-fighters>

105 Boeing (n.d.): Boeing Middle East – Kingdom of Saudi Arabia (Accessed 7.3.19) <https://www.boeing-me.com/en/boeing-in-the-middle-east/partnerships-in-the-middle-east/kingdom-of-saudi-arabia.page?>

106 PAX (last updated 22.1.18): Dont Bank on the Bomb Boeing (Accessed 7.3.19) <https://www.dontbankonthebomb.com/boeing/>

107 Boeing (n.d.): Boeing: Autonomous Systems (Accessed 7.3.19) <https://www.boeing.com/defense/autonomous-systems/index.page>

108 U.S. Air Force (15.9.11): Scan Eagle (Accessed 7.3.19) <https://web.archive.org/web/20130710112005/http://www.af.mil/information/factsheets/factsheet.asp?id=10468>

109 Air Force Technology (n.d.): X-45 J-UCAV (Joint Unmanned Combat Air System) (Accessed 7.3.19) <https://www.airforce-technology.com/projects/x-45-ucav/>

110 Air Force Technology (n.d.): X-45 J-UCAV (Joint Unmanned Combat Air System) (Accessed 7.3.19) <https://www.airforce-technology.com/projects/x-45-ucav/>

111 Military Factory (25.4.16): Boeing X-45 Unmanned Combat Air Vehicle Prototype (Accessed 7.3.19) [https://www.militaryfactory.com/aircraft/detail.asp?aircraft\\_id=1153](https://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=1153)

112 Evan Ackerman (4.5.11): Phantom Ray UCAS Makes First Flight. IEEE Spectrum (Accessed 7.3.19) <https://spectrum.ieee.org/automaton/robotics/military-robots/boeing-phantom-ray-ucav-makes-first-flight>

113 SIPRI (2018): The SIPRI top 100 arms-producing and military services companies, 2017 [https://www.sipri.org/sites/default/files/2018-12/fs\\_arms\\_industry\\_2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-12/fs_arms_industry_2017_0.pdf) (Accessed 7.3.19)

114 Amnesty International (16.10.18): Egypt: France flouts international law by continuing to export arms used in deadly crackdowns (Accessed 7.3.19) <https://www.amnesty.org/en/latest/news/2018/10/egypt-france-flouts-international-law-by-continuing-to-export-arms-used-in-deadly-crackdowns/>

115 Amnesty International (2018): Egypt: how French arms were used to crush dissent (Accessed 7.3.19) <https://www.amnesty.org/download/Documents/EUR2190382018ENGLISH.PDF>

116 We Are the Mighty (20.11.18): Why Houthi rebels are kicking the crap out of the world's best tank (Accessed 7.3.19) <https://www.wearethemighty.com/why-are-houthis-rebelling?rebellitem=1#rebellitem1>

117 Zena Tahaan (2.7.18): 'Egyptian society being crushed' five years after military coup. Al Jazeera (Accessed 7.3.19) <https://www.aljazeera.com/indepth/features/2017/07/egypt-worse-indicator-2013-coup-170702072016494.html>

118 General Dynamics (n.d.): Corporate Sustainability Report (Accessed 7.3.19) [https://www.gd.com/sites/default/files/2018\\_gd\\_sustainability\\_report.pdf](https://www.gd.com/sites/default/files/2018_gd_sustainability_report.pdf)

119 Business Wire (2019): AeroVironment and General Dynamics Land Systems Join Forces to Integrate Unmanned Aircraft and Tactical Missile Systems with Armored Combat Vehicles. <https://www.businesswire.com/news/home/20181008005240/en/AeroVironment-General-Dynamics-Land-Systems-Join-Forces>

120 PAX (2017): Where to draw the line: Increasing Autonomy in Weapon Systems – Technology and Trends <https://www.paxforpeace.nl/publications/all-publications/where-to-draw-the-line>

121 SIPRI (2018): The SIPRI top 100 arms-producing and military services companies, 2017 (Accessed 14.3.19) [https://www.sipri.org/sites/default/files/2018-12/fs\\_arms\\_industry\\_2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-12/fs_arms_industry_2017_0.pdf)

122 Leonardo Company Annual Financial Report 2017 (Accessed 14.3.19) [https://www.leonardocompany.com/documents/63265270/68487135/body\\_5\\_Leonardo\\_RFA\\_ING\\_2017\\_03.05.18.pdf](https://www.leonardocompany.com/documents/63265270/68487135/body_5_Leonardo_RFA_ING_2017_03.05.18.pdf)

123 Defense-Aerospace (11.6.11): Leonardo Responds to Allegations of Illegal Payments (Accessed 14.3.19) <http://www.defense-aerospace.com/articles/view/verbatim/4/193817/leonardo-responds-to-allegations-of-illegal-payments.html> and Paul Holden (8.6.18): Other countries tackle claims of arms trade corruption. Why not the UK? The Guardian. (Accessed 14.3.19) <https://www.theguardian.com/commentisfree/2018/jun/08/arms-trade-corruption-claims-uk-italy-india-agustawestland>

124 Leonardo (9.10.18): Leonardo joins the United Nations Global Compact and consolidates its commitment to sustainable development (Accessed 14.3.19) <https://www.leonardocompany.com/en/-/leonardo-aderisce-al-global-compact>

125 Ginger Hervey (24.1.18): Germany faces calls to end arms exports to Turkey. Politico. (Accessed 14.3.19) <https://www.politico.eu/article/germany-faces-calls-to-end-arms-exports-to-turkey/>

126 Bethan McKernan (23.2.18): Syria: 'Unlawful' civilian deaths in Afrin condemned as Assad forces raise stakes in Kurdish-Turkish conflict. The Independent. (Accessed 14.3.19) <https://www.independent.co.uk/news/world/middle-east/syria-civil-war-afrin-civilian-death-assad-regimes-rebels-kurdish-turkey-fighting-ygp-a8225506.html>

127 Evan Hill (13.6.17): The Dangers of Arming Autocrats. The Atlantic. (Accessed 14.3.19) <https://www.theatlantic.com/international/archive/2017/06/saudi-arabia-weapons-deal/529689/> and Matthew Haag (20.4.17): Video Appears to Show Egyptian Soldiers Killing Unarmed Men in Sinai. The New York Times. (Accessed 14.3.19) <https://www.nytimes.com/2017/04/20/world/middleeast/egypt-soldiers-extrajudicial-killings-sinai-peninsula.html>

128 Leonardo (n.d.): Controls on exports and sensitive countries (Accessed 14.3.19) <https://www.leonardocompany.com/en/chi-siamo-about-us/etica-compliance/controlli-sulle-esportazioni-e-paesi-sensibili>

129 Reuters (13.8.19): Egypt voices concern over Red Sea security after Houthi attack (Accessed 14.3.19) <https://www.reuters.com/article/us-yemen-security-egypt/egypt-voices-concern-over-red-sea-security-after-houthi-attack-idUSKBN1KY1XQ>

130 Leonardo (nd): Autonomous Systems. (Accessed 18.04.2019) <https://www.leonardocompany.com/en/innovation/our-technologies/autonomous-systems>

131 Lockheed Martin Corporation Annual Report 2017 (Accessed 14.3.19) <https://www.lockheedmartin.com/content/dam/lockheed-martin/eo/documents/annual-reports/2017-annual-report.pdf>

132 Lockheed Martin Corporation Sustainability Report 2017 (Accessed 14.3.19) [https://www.lockheedmartin.com/content/dam/lockheed-martin/eo/documents/sustainability/Lockheed\\_Martin\\_Sustainability\\_Report\\_Full\\_2017.pdf](https://www.lockheedmartin.com/content/dam/lockheed-martin/eo/documents/sustainability/Lockheed_Martin_Sustainability_Report_Full_2017.pdf)

133 ADHRB (n.d.): NGO Submission: Report of the HRC on the impact of arms transfers on human rights (Accessed 14.3.19) <https://www.ohchr.org/Documents/Issues/RuleOfLaw/ArmsTransfers/AmericansDemocracyAndHumanRightsInBahrain.pdf>

134 Defense World (23.6.18): Lockheed Martin to Supply F-16 Block 70 Fighter Jets Worth \$1.12B To Bahrain (Accessed 14.3.19) [http://www.defenseworld.net/news/22756/Lockheed\\_Martin\\_To\\_Supply\\_F\\_16\\_Block\\_70\\_Fighter\\_Jets\\_Worth\\_1\\_12B\\_To\\_Bahrain#.XFG8Hc9KgWp](http://www.defenseworld.net/news/22756/Lockheed_Martin_To_Supply_F_16_Block_70_Fighter_Jets_Worth_1_12B_To_Bahrain#.XFG8Hc9KgWp)

135 Barbara Opall-Rome (14.11.17): Raytheon: Arab-operated Patriots intercepted over 100 tactical ballistic missiles since 2015. Defense News. (Accessed 14.3.19) <https://www.defensenews.com/digital-show-dailies/dubai-air-show/2017/11/14/raytheon-saudi-based-patriots-intercepted-over-100-tbms-since-2015/>

136 Lockheed Martin (n.d.): Lockheed Martin CEO Statement on U.S. – Kingdom of Saudi Arabia Announcement (Accessed 14.3.19) <https://www.lockheedmartin.com/en-us/news/statements-speeches/2017/ceo-statement-saudi-arabia-announcement.html>

137 Department of Defense (2019): Airforce. Contracts for April 16, 2019 <https://dod.defense.gov/News/Contracts/Contract-View/Article/1815651/>

138 Robotics @ MIT (n.d.): MIT, Lockheed Martin launch long-term research collaboration (Accessed 14.3.19) <https://robotics.mit.edu/mit-lockheed-martin-launch-long-term-research-collaboration>

139 Defense Aerospace (3.11.05): Lockheed Martin Successfully Flight Tests Low-Cost Autonomous Attack System (Accessed 14.3.19) [http://www.defense-aerospace.com/articles/view/release/3/64138/low-cost-autonomous-attack-system-tested-\(nov-4\).html](http://www.defense-aerospace.com/articles/view/release/3/64138/low-cost-autonomous-attack-system-tested-(nov-4).html)

140 Orhan Gozaydin (n.d.): Analysis of cooperative behavior for autonomous wide area search munitions (Accessed 14.3.19) <https://apps.dtic.mil/dtic/tr/fulltext/u2/a412721.pdf>

141 Boulanin and Verbruggen (2017): Mapping the development of autonomy in systems. SIPRI research [https://www.sipri.org/sites/default/files/2017-11/sipriresearch\\_mapping\\_the\\_development\\_of\\_autonomy\\_in\\_weapon\\_systems\\_1117\\_1.pdf](https://www.sipri.org/sites/default/files/2017-11/sipriresearch_mapping_the_development_of_autonomy_in_weapon_systems_1117_1.pdf)

142 Kyle Mizokami (11.4.17): The Air Force Turned a F-16 Fighter into a Drone. Popular Mechanics. (Accessed 14.3.19) <https://www.popularmechanics.com/military/research/a26028/f-16-drone-have-raider-ii/>

143 Zach Rosenberg (27.4.17): Military Drones Can Now Deal With Threats on Their Own. Air&Space Smithsonian (Accessed 14.3.19) <https://www.airspacemag.com/daily-planet/no-pilot-no-problem-180963050/#7KK67ghZeiVLSU.99>

144 Zach Rosenberg (27.4.17): Military Drones Can Now Deal With Threats on Their Own. Air & Space Smithsonian (Accessed 14.3.19) <https://www.airspacemag.com/daily-planet/no-pilot-no-problem-180963050/>

145 Flight Global (2016): Pentagon touts "Loyal Wingman" for combat jets. <https://www.flightglobal.com/news/articles/pentagon-touts-loyal-wingman-for-combat-jets-423682/> (http://warisboring.com/2018-the-year-u-s-fighter-pilots-could-get-drone-wingmen/))

146 Lockheed Martin (nd): Squad Mission Support System. <https://www.lockheedmartin.com/en-us/products/sms.html>

147 Global Security (2018): Sensitive Guided Stand-off Cruise Missile. <https://www.globalsecurity.org/wmd/world/turkey/lrcm.htm>

148 Northrop Grumman Annual Report 2017 (Accessed 14.3.19) <http://investor.northropgrumman.com/static-files/78d24d32-9359-463e-aef0-7f2649d84e4e>

149 Sipri (2018): The Sipri top 100 arms-producing and military services companies, 2017 (Accessed 7.3.19) [https://www.sipri.org/sites/default/files/2018-12/fs\\_arms\\_industry\\_2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-12/fs_arms_industry_2017_0.pdf)

150 Associated Press (30.3.17): Trump administration drops human rights conditions to sell fighter jets to Bahrain. The Guardian. (Accessed 14.3.19) <https://www.theguardian.com/world/2017/mar/30/trump-administration-human-rights-fighter-jets-bahrain>

151 Air Force Technology (12.6.17): Northrop to Yemver APG-83 radars for US Air National Guard's F-16 fleet (Accessed 14.3.19) <https://www.airforce-technology.com/news/newsnorthrop-to-deliver-apg-83-radars-for-us-air-national-guards-f-16-fleet-5841337/>

152 Carol Morello (29.3.17): State Department drops human rights as condition for fighter jet sale to Bahrain. The Washington Post. (Accessed 14.3.19) [https://www.washingtonpost.com/world/national-security/state-department-drops-human-rights-as-condition-for-fighter-jet-sale-to-bahrain/2017/03/29/6762d422-1abf-406e-aaff-fb-c56a2e0ac\\_story.html?utm\\_term=.0d41cf-8759ba](https://www.washingtonpost.com/world/national-security/state-department-drops-human-rights-as-condition-for-fighter-jet-sale-to-bahrain/2017/03/29/6762d422-1abf-406e-aaff-fb-c56a2e0ac_story.html?utm_term=.0d41cf-8759ba)

153 Reuters (30.12.15): Bahraini jet taking part in Yemen war crashes in Saudi Arabia: coalition (Accessed 14.3.19) <https://www.reuters.com/article/us-yemen-security-bahrain/bahraini-jet-taking-part-in-yemen-war-crashes-in-saudi-arabia-coalition-idUSKB-N0UDOLK20151230>

154 Northrop Grumman (nd): Who we are in the Middle East. <https://www.northropgrumman.com/AboutUs/OurGlobalPresence/MiddleEastAndAfrica/Pages/Who-We-Are-in-the-Middle-East.aspx>

155 Northrop Grumman (n.d.): Ethics and Business Conduct (Accessed 14.3.19) <http://www.northropgrumman.com/CorporateResponsibility/Ethics/Pages/default.aspx>

156 PAX (n.d.): Don't Bank on the Bomb Nuclear Weapon Producers (Accessed 14.3.19) <https://www.dontbankonthebomb.com/nuclear-weapon-producers/>

157 Northrop Grumman Annual Report 2017 (Accessed 14.3.19) <http://investor.northropgrumman.com/static-files/78d24d32-9359-463e-aef0-7f2649d84e4e>

158 Northrop Grumman (n.d.): Switchblade (Accessed 14.3.19) <https://www.northropgrumman.com/Capabilities/Switchblade/Pages/default.aspx>

159 Naval Technology (13.4.18): AeroVironment demonstrates Puma-Switchblade automated s2s capability (Accessed 14.3.19) <https://www.naval-technology.com/news/aerovironment-demonstrates-puma-switchblade-automated-s2s-capability/>

160 Mike Rees (11.4.18): AeroVironment Demos Automated Sensor-to-Shooter Capability with Puma UCAS. Unmanned Systems Technology. (Accessed 14.3.19) <https://www.unmannedsystemstechnology.com/2018/04/aerovironment-demonstrates-automated-sensor-shooter-capability-puma-uas/>

161 Military Factory (n.d.): Northrop Grumman X-47B UCAV (Accessed 14.3.19) [https://www.militaryfactory.com/aircraft/detail.asp?aircraft\\_id=1015](https://www.militaryfactory.com/aircraft/detail.asp?aircraft_id=1015)

162 PAX (2017): Where to draw the line: Increasing Autonomy in Weapon Systems – Technology and Trends <https://www.paxforpeace.nl/publications/all-publications/where-to-draw-the-line>

163 Raytheon Emirates (n.d.): Who We Are (Accessed 14.3.19) <https://www.raytheon.com/uae/ourcompany>

164 Defense World (18.2.19): Raytheon Wins \$353 Million Deal to Supply Patriot Missiles To UAE At IDEX 2019 (Accessed 14.3.19) [http://www.defenseworld.net/news/24291/Raytheon\\_Wins\\_353\\_Million\\_Deal\\_to\\_Supply\\_Patriot\\_Missiles\\_to\\_UAE\\_at\\_IDEX\\_2019#.XGwRj5MzWwo](http://www.defenseworld.net/news/24291/Raytheon_Wins_353_Million_Deal_to_Supply_Patriot_Missiles_to_UAE_at_IDEX_2019#.XGwRj5MzWwo)

- 165 Shaul Shay (2018): The Saudi Arabian Military Industries (SAMI). Herzliya Conference Papers. (Accessed 14.3.19) <https://www.idc.ac.il/en/research/ips/2018/Documents/ShaulShaySAM122.4.18.pdf>
- 166 PAX (29.1.18): Don't Bank on the Bomb Raytheon (Accessed 14.3.19) <https://www.dontbankonthebomb.com/raytheon/>
- 167 Raytheon (1.6.18, last updated 25.1.19): A missile for the U.S. Navy (Accessed 14.3.19) <https://www.raytheon.com/news/feature/missile-us-navy>
- 168 Defense Industry Daily (18.12.18): Kongsberg's NSM/JSM Anti-Ship & Strike Missile Attempts to Fit in Small F-35 Stealth Bay (Accessed 14.3.19) <https://www.defenseindustrydaily.com/norwegian-contract-launches-nsm-missile-03417/>
- 169 Joseph Trevithick (31.5.18): It's Official, The Navy's Next Anti-Ship Cruise Missile Will Be The Naval Strike Missile. The Drive. (Accessed 14.3.19) <http://www.thedrive.com/the-war-zone/21233/its-official-the-navys-next-anti-ship-cruise-missile-will-be-the-naval-strike-missile>
- 170 Raytheon (29.6.18, last updated 4.10.18): Mind of the Swarm (Accessed 14.3.19) <https://www.raytheon.com/news/feature/mind-swarm>
- 171 Mönch Publishing Group (20.2.19): IDEX: Raytheon Showcases Several Products (Accessed 14.3.19) <https://www.monch.com/mpg/news/land/5049-idx-raytheon-ram-coyote.html>
- 172 Business Wire (2019): Global Autonomous Navigation Market Outlook, 2019-2030 - Anticipated to Exhibit a CAGR of 16.19%, with Raytheon, Thales, Northrop Grumman, Safran, and Honeywell International Dominating. March 20th. (Accessed 14.3.19) <https://www.apnews.com/60fa08d6b383422b3908f5a3f5d876>
- 173 Raytheon (2017): Raytheon sponsors futuristic research center New Caltech lab will build next-gen autonomous systems. [https://www.raytheon.com/news/feature/future\\_of\\_autonomy](https://www.raytheon.com/news/feature/future_of_autonomy)
- 174 Rheinmetall (2018): Annual Report 2017. <https://ir.rheinmetall.com/download/companies/rheinmetall/Annual%20Reports/DE0007030009-JA-2016-EQ-E-00.pdf>
- 175 Arie Egozi (30.4.18): Germany a growing arms supplier to Egypt. Defence Web. (Accessed 14.3.19) <https://www.defenceweb.co.za/industry/industry-industry/germany-a-growing-arms-supplier-to-egypt/>
- 176 Rheinmetall Corporate Responsibility Report 2017 (Accessed 14.3.19) [https://www.rheinmetall.com/en/rheinmetall\\_ag/corporate\\_social\\_responsibility/csr\\_report/index.php](https://www.rheinmetall.com/en/rheinmetall_ag/corporate_social_responsibility/csr_report/index.php)
- 177 Zeenat Adam (26.7.18): South Africa's deadly involvement in the Saudi war on Yemen. Middle East Eye. (Accessed 14.3.19) <https://www.middleeasteye.net/opinion/south-africas-deadly-involvement-saudi-war-yemen>
- 178 ECCHR (2018): Are arms manufacturers and Italian authorities complicit in Deadly Saudi Coalition airstrike in Yemen? 18 April 2018. (Accessed 08.04.2019) <https://www.ecchr.eu/nc/en/press-release/are-arms-manufacturer-and-italian-authorities-complicit-in-deadly-saudi-coalition-air-strike-in-yemen/>
- 179 RheinmetallAG (2.7.15): Kuwait Orders Advanced Armored NBC Reconnaissance Vehicles. Defense Talk. (Accessed 14.3.19) <https://www.defencetalk.com/kuwait-orders-advanced-armored-nbc-reconnaissance-vehicles-64772/>
- 180 PAX (n.d.): Don't Bank on the Bomb Nuclear Weapon Producers (Accessed 14.3.19) <https://www.dontbankonthebomb.com/nuclear-weapon-producers/>
- 181 GIWS (nd): SMARt 155 a new dimension for Artillery. <http://www.giws.de/en/smart/system.html>
- 182 Revolv (n.d.): SMARt 155 (Accessed 14.3.19) <https://www.revolv.com/page/SMARt-155>
- 183 Heather Roff (16.1.15, updated 18.3.15): Autonomous or 'semi' Autonomous Weapons? A Distinction Without Difference. Huffpost. (Accessed 14.3.19) [https://www.huffingtonpost.com/heather-roff/autonomous-or-semi-autono\\_b\\_6487268.html](https://www.huffingtonpost.com/heather-roff/autonomous-or-semi-autono_b_6487268.html)
- 184 Christopher F Foss (18.12.18): Weaponised Mission Master UGV takes shape. Jane's 360. (Accessed 14.3.19) <https://www.janes.com/article/85307/weaponised-mission-master-ugv-takes-shape>
- 185 Army Recognition (12.9.17): Multi Mission Unmanned Group Vehicle Rheinmetall from Germany DSEI 2017 (Accessed 4.3.19) [https://www.armyrecognition.com/dsei\\_2017\\_news\\_online\\_show\\_daily\\_coverage\\_report\\_u\\_multi\\_mission\\_unmanned\\_ground\\_vehicle\\_rheinmetall\\_from\\_germany\\_dsei\\_2017.html](https://www.armyrecognition.com/dsei_2017_news_online_show_daily_coverage_report_u_multi_mission_unmanned_ground_vehicle_rheinmetall_from_germany_dsei_2017.html)
- 186 Paolo Valpolini (22.6.18): Rheinmetall unveils its production UGV. European Defence Review. (Accessed 14.3.19) <https://www.edrmagazine.eu/rheinmetall-unveils-its-production-ugv>
- 187 Military Leak (n.d.): Rheinmetall Unmanned Ground Vehicle (Accessed 14.3.19) <https://militaryleak.com/2018/01/11/mmguv/>
- 188 Pressebox (2017): Rheinmetall auf der IDEX 2017 - starker Partner für Sicherheitskräfte <https://www.pressebox.de/presscorner/firma/rheinmetall-ag/meldung/boxid/838369/iframe/2713>
- 189 Manufacturer's Monthly (2018): Rheinmetall, DST sign research partnership for autonomous systems. 22 Oct. <http://www.manmonthly.com.au/news/rheinmetall-dst-sign-research-partnership-autonomous-systems/>
- 190 Grevatt, J (2018): Rheinmetall and Australia's DST to collaborate on autonomous vehicle systems. Janes 360. <https://www.janes.com/article/83934/rheinmetall-and-australia-s-dst-to-collaborate-on-autonomous-vehicle-systems>
- 191 SIPRI (2018): The SIPRI top 100 arms-producing and military services companies, 2017 (Accessed 14.3.19) [https://www.sipri.org/sites/default/files/2018-12/fs\\_arms\\_industry\\_2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-12/fs_arms_industry_2017_0.pdf)
- 192 Thales (nd): Defense in UAE. <https://www.thalesgroup.com/en/worldwide/defence-1>
- 193 Amnesty International (2018): Egypt: How French Arms Were Used to Crush Dissent (Accessed 14.3.19) <https://www.amnesty.org/download/Documents/EUR2190382018EN-GLISH.PDF>
- 194 fidh (2.7.18): Egypt: a repression made in France (Accessed 14.3.19) <https://www.fidh.org/en/issues/litigation/egypt-a-repression-made-in-france>
- 195 Thales (n.d.): Egypt (Accessed 14.3.19) <https://www.thalesgroup.com/en/countries/middle-east-africa/egypt>
- 196 OXFAM (2015): Yemen Needs Peace, Not Arms (Accessed 14.3.19) <https://www.oxfamnovib.nl/Redactie/Pdf/Yemen%20Needs%20Peace%20Not%20Arms%20November%202015.pdf>
- 197 Thales (nd): Defense in UAE. <https://www.thalesgroup.com/en/worldwide/defence-1>
- 198 PAX (n.d.): Don't Bank on the Bomb Thales (Accessed 14.3.19) <https://www.dontbankonthebomb.com/thales/>
- 199 <https://www.defenseneews.com/intel-geoint/2018/03/16/france-to-increase-investment-in-ai-for-future-weapon-systems/>
- 200 Thales (n.d.): At the forefront of UAS (Accessed 14.3.19) <https://www.thalesgroup.com/en/activities/defence/unmanned-aerial-vehicles-systems>
- 201 Global Defense Technology (n.d.): Who watches the Watchkeeper? (Accessed 14.3.19) [https://defence.nridigital.com/global\\_defence\\_technology\\_sep18/who\\_watches\\_the\\_watchkeeper\\_a\\_look\\_inside\\_the\\_uk\\_s\\_troubled\\_uav\\_programme](https://defence.nridigital.com/global_defence_technology_sep18/who_watches_the_watchkeeper_a_look_inside_the_uk_s_troubled_uav_programme)
- 202 Army Technology (n.d.): Watchkeeper X Unmanned Aircraft System (UAS) (Accessed 14.3.19) <https://www.army-technology.com/projects/watchkeeper-x-unmanned-aircraft-system-uas/>
- 203 Naval technology (nd): Thales Autonomous Marine Systems <https://www.naval-technology.com/news/thales-autonomous-marine-systems/>
- 204 SIPRI (2018): The SIPRI top 100 arms-producing and military services companies, 2017 (Accessed 14.3.19) [https://www.sipri.org/sites/default/files/2018-12/fs\\_arms\\_industry\\_2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-12/fs_arms_industry_2017_0.pdf)
- 205 ThyssenKrupp (n.d.): Marine Systems (Accessed 14.3.19) <https://www.thyssenkrupp-marinesystems.com/en/home.html>
- 206 ThyssenKrupp Annual Report 2016/2017 (Accessed 14.3.19) [https://www.thyssenkrupp.com/media/investoren/berichterstattung\\_publicationen/update\\_23\\_11\\_2017/en/10\\_neu2\\_gb\\_2016\\_2017\\_thyssenkrupp\\_gb\\_eng\\_web.pdf](https://www.thyssenkrupp.com/media/investoren/berichterstattung_publicationen/update_23_11_2017/en/10_neu2_gb_2016_2017_thyssenkrupp_gb_eng_web.pdf)
- 207 Arie Egozi (30.4.18): Germany a growing arms supplier to Egypt. Defence Web. (Accessed 14.3.19) <https://www.defenceweb.co.za/industry/industry-industry/germany-a-growing-arms-supplier-to-egypt/>
- 208 Arie Egozi (30.4.18): Germany a growing arms supplier to Egypt. Defence Web. (Accessed 14.3.19) <https://www.defenceweb.co.za/industry/industry-industry/germany-a-growing-arms-supplier-to-egypt/>
- 209 Human Rights Watch (04.06.17): Israel: 50 Years of Occupation Abuse, Ramp Up Pressure for Accountability on all Sides (Accessed: 10.04.19) <https://www.hrw.org/news/2017/06/04/israel-50-years-occupation-abuses>
- 210 UCDP: Israel/Palestine (Accessed: 10.04.19) <https://www.ucdp.uu.se/#/conflict/234>
- 211 Tagesschau (15.03.19): Nahost-Konflikt: Wieder fliegen Raketen im Gazastreifen (Accessed: 10.04.19) <https://www.tagesschau.de/ausland/angriff-israel-101.html>
- 212 Israel Defense (15.03.19): IDF Strikes 100 Targets in Gaza in Response to Rockets Fired at Tel Aviv (Accessed: 10.04.19) <https://www.israeldefense.co.il/en/node/37806>
- 213 Wikipedia: List of wars involving Israel (Accessed: 10.04.19) [https://en.wikipedia.org/wiki/List\\_of\\_wars\\_involving\\_Israel#Table](https://en.wikipedia.org/wiki/List_of_wars_involving_Israel#Table)
- 214 UCDP: Government of Israel (Accessed: 10.04.19) <https://www.ucdp.uu.se/#actor/121>
- 215 AusRelief (08.06.18): Human Rights Violations in Israel#s Occupation of Palestine (Accessed: 10.04.19) <https://www.ausrelief.org/news/human-rights-violations-in-israels-occupation-of-palestine>
- 216 UN Fact Sheet: Humanitarian situation in the Gaza Strip Fast Facts - OCHA factsheet (Accessed: 10.04.19) <https://www.un.org/unispa/humanitarian-situation-in-the-gaza-strip-fast-facts-ocha-factsheet/>
- 217 +972 Magazine (31.03.19): Hundreds of Israelis protest Gaza blockade outside IDF headquarters (Accessed: 10.04.19) <https://972mag.com/israel-protesters-demand-end-gaza-blockade-outside-idf-headquarters/140801/>
- 218 Human Rights Watch (13.06.18): Israel: Apparent War Crimes in Gaza, Accountability Needed for Officials Who Authorized Lethal Force (Accessed: 10.04.19) <https://www.hrw.org/news/2018/06/13/israel-apparent-war-crimes-gaza>
- 219 UN News (28.02.19): Gaza probe finds 'reasonable grounds' Israeli forces committed international human rights violation (Accessed: 10.04.19) <https://news.un.org/en/story/2019/02/1033742>
- 220 Human Rights Watch (13.06.18): Israel: Apparent War Crimes in Gaza, Accountability Needed for Officials Who Authorized Lethal Force (Accessed: 10.04.19) <https://www.hrw.org/news/2018/06/13/israel-apparent-war-crimes-gaza>
- 221 Amnesty International, Israel and occupied Palestinian territories 2017/2018 (Accessed: 10.04.19) <https://www.amnesty.org/en/countries/middle-east-and-north-africa/israel-and-occupied-palestinian-territories-report-israel-and-occupied-palestinian-territories/> and Human Rights Watch (04.06.17): Israel: 50 Years of Occupation Abuse, Ramp Up Pressure for Accountability on all Sides (Accessed: 10.04.19) <https://www.hrw.org/news/2017/06/04/israel-50-years-occupation-abuses>
- 222 Human Rights Watch, Israel and Palestine, Events of 2018 (Accessed: 10.04.19) <https://www.hrw.org/world-report/2019/country-chapters/israel/palestine>
- 223 Amnesty International (27.04.18): Israel: Armes embargo needed as military unlawfully kills and maims Gaza protesters (Accessed: 10.04.19) <https://www.amnesty.org/en/latest/news/2018/04/israel-arms-embargo-needed-as-military-unlawfully-kills-and-maims-gaza-protesters/>
- 224 SIPRI (2018): Trends in international arms transfers 2017. [https://www.sipri.org/sites/default/files/2018-03/fssipri\\_at2017\\_0.pdf](https://www.sipri.org/sites/default/files/2018-03/fssipri_at2017_0.pdf)
- 225 Steven Erlanger, The New York Times (10.09.09): A Gaza War Full of Traps and Trickery (Accessed: 10.04.19) <https://www.nytimes.com/2009/01/11/world/middleeast/11hamas.html> and Florian Rötzer, Telepolis (01.01.09) Israel setzt gegen die Hamas neue US-Präzisionsbombe ein (Accessed: 10.04.19) <https://www.heise.de/tp/news/Israel-setzt-gegen-die-Hamas-neue-US-Präzisionsbomben-ein-2005314.html>
- 226 Israel Defense (15.03.19): IDF Strikes 100 Targets in Gaza in Response to Rockets Fired at Tel Aviv (Accessed: 10.04.19) <https://www.israeldefense.co.il/en/node/37806>
- 227 Memo, Middle East Monitor (13.02.19): Extent of Israel attacks on Gaza fishermen revealed (Accessed: 10.04.19) <https://www.middleeastmonitor.com/20190213-extent-of-israel-attacks-on-gaza-fishermen-revealed/>
- 228 Prof. Michael Chossudovsky, Global Research (08.01.09): War and Natural Gas: The Israeli Invasion and Gaza's Offshore Gas Fields (Accessed: 10.04.19) <https://www.globalresearch.ca/war-and-natural-gas-the-israeli-invasion-and-gaza-s-offshore-gas-fields/11680>
- 229 Igor Pejic, Global Research (04.02.16): Autonomous Weapon Systems and US Military Robotics: Unmanned Aerial and Ground Vehicles (UAV and UGV) (Accessed: 10.04.19) <https://www.globalresearch.ca/autonomous-weapon-systems-and-us-military-robotics-unmanned-aerial-and-ground-vehicles-uav-and-ugv/5505415>
- 230 Markus Becker, Spiegel Online (27.04.14): Factory and Lab, Israel's War Business (Accessed: 10.04.19) <http://www.spiegel.de/international/world/defence-industry-the-business-of-war-in-israel-a-988245.html> and IAI, Guardian: A New Dimension in Controlled Area Defense (Accessed: 10.04.19) [http://www.iaicoil.com/Sip\\_Storage/FILES/033810.pdf](http://www.iaicoil.com/Sip_Storage/FILES/033810.pdf)
- 231 Yaakov Lappin, The Jerusalem Post (18.02.15), IDF expects UGVs, Robots to play ever-greater roles in combat (Accessed: 10.04.19) <https://www.jpost.com/Arab-Israeli-Conflict/IDF-expects-UGVs-robots-to-play-ever-greater-roles-in-combat-391365>
- 232 IAI (2008): Guardian Autonomous Unmanned Ground Vehicle Evaluated by Israel Airports Authority. 16 June. <http://www.iaicoil.com/Shared/UserControls/Print/PopUp.aspx?lang=en&docid=38608>
- 233 IAI (nd): Loitering Attack Munitions: Harpy NG. [http://www.iaicoil.com/2013/36694-16153-en-Business\\_Areas\\_Land.aspx](http://www.iaicoil.com/2013/36694-16153-en-Business_Areas_Land.aspx)
- 234 Scharre, Paul (2018): "Army of none: autonomous weapons and the future of war." New York: W.W. Norton & Company: 46-48.
- 235 Sharkey, Noel E. (2012): "The inevitability of autonomous robot warfare." International Review of the Red Cross 94 (886): 788.
- 236 Human Rights Watch (11.7.16): Saudi Coalition Airstrikes Target Civilian Factories in Yemen (Accessed 14.3.19) <https://www.hrw.org/news/2016/07/11/saudi-coalition-air-strikes-target-civilian-factories-yemen>
- 237 Samuel Perlo-Freeman (28.2.18): Who is arming the Yemen war? (And is anyone planning to stop?) World Peace Foundation. (Accessed 14.3.19) <https://sites.tufts.edu/reinventingpeace/2018/02/28/who-is-arming-the-yemen-war-and-is-anyone-planning-to-stop/>
- 238 Human Rights Watch (8.9.17): Yemen: Hiding Behind Coalition's Unlawful Attacks (Accessed 14.3.19) <https://www.hrw.org/news/2017/09/08/yemen-hiding-behind-coalitions-unlawful-attacks>
- 239 Human Rights Watch (11.7.16): Saudi Coalition Airstrikes Target Civilian Factories in Yemen (Accessed 14.3.19) <https://www.hrw.org/news/2016/07/11/saudi-coalition-air-strikes-target-civilian-factories-yemen>
- 240 OHCHR (n.d.): Yemen: United Nations Experts point to possible war crimes by parties to the conflict (Accessed 14.3.19) <https://www.ohchr.org/EN/HRBodies/HRC/Pages/NewsDetail.aspx?NewsID=23479&LangID=E>
- 241 OHCHR (n.d.): Yemen: United Nations Experts point to possible war crimes by parties to the conflict (Accessed 14.3.19) <https://www.ohchr.org/EN/HRBodies/HRC/Pages/NewsDetail.aspx?NewsID=23479&LangID=E>
- 242 Save the Children (n.d.): Yemen (Accessed 14.3.19) <https://www.savethechildren.de/unterstuetzen/nothilfe/jemen/>
- 243 Save the Children (n.d.): Yemen (Accessed 14.3.19) <https://www.savethechildren.de/unterstuetzen/nothilfe/jemen/>
- 244 OHCHR (n.d.): Yemen: United Nations Experts point to possible war crimes by parties to the conflict (Accessed 14.3.19) <https://www.ohchr.org/EN/HRBodies/HRC/Pages/NewsDetail.aspx?NewsID=23479&LangID=E>

- 245 Sudarsan Raghavan (7.3.19): American and British bomb killed more than 200 Yemeni civilians. The Washington Post. (Accessed 14.3.19) <https://www.bostonglobe.com/news/world/2019/03/06/american-and-british-bombs-killed-more-than-yemeni-civilians-report-says/GFCiB3u8B0anDq1nIub80/story.html>
- 246 Human Rights Watch (n.d.): Bombing Businesses – Saudi Coalition Airstrikes on Yemen's Civilian Economic Structures (Accessed 14.3.19) [https://www.hrw.org/sites/default/files/report\\_pdf/yemen0716web.pdf](https://www.hrw.org/sites/default/files/report_pdf/yemen0716web.pdf)
- 247 Aaron Mehta (16.11.15): US Clears Sale of Air-to-Ground Weapons to Saudi Arabia. Defense News. (Accessed 14.3.19) <https://www.defensenews.com/air/2015/11/16/us-clears-sale-of-air-to-ground-weapons-to-saudi-arabia/>
- 248 Aaron Mehta (16.11.15): US Clears Sale of Air-to-Ground Weapons to Saudi Arabia. Defense News. (Accessed 14.3.19) <https://www.defensenews.com/air/2015/11/16/us-clears-sale-of-air-to-ground-weapons-to-saudi-arabia/>
- 249 CNN (17.8.18): Bomb in Yemen school bus strike was US-supplied by the US (Accessed 14.3.19) <https://edition.cnn.com/2018/08/17/middleeast/us-saudi-yemen-bus-strike-intl/index.html>
- Julian Borger (19.8.18): US supplied bomb that killed 40 children on Yemen school bus. The Guardian. (Accessed 14.3.19) <https://www.theguardian.com/world/2018/aug/19/us-supplied-bomb-that-killed-40-children-school-bus-yemen>
- 250 OECD Watch (2016): ECDHR et al vs Boeing & Lockheed Martin. Filed. 23 June. [https://complaints.oecdwatch.org/cases/Case\\_474](https://complaints.oecdwatch.org/cases/Case_474)
- 251 ECCHR (n.d.): War crimes in Yemen (Accessed 14.3.19) <https://www.ecchr.eu/en/case/european-responsibility-for-war-crimes-in-yemen/>
- 252 Andrew Chuter (13.4.17): Paveway IV leads UK investment in munitions replenishment for anti-ISIS fight. Defense News. (Accessed 14.3.19) <https://www.defensenews.com/air/2017/04/13/paveway-iv-leads-uk-investment-in-munitions-replenishment-for-anti-isis-fight/>
- 253 Human Rights Watch (11.7.16): Saudi Coalition Airstrikes Target Civilian Factories in Yemen (Accessed 14.3.19) <https://www.hrw.org/news/2016/07/11/saudi-coalition-airstrikes-target-civilian-factories-yemen>
- 254 Human Rights Watch (11.7.16): Bombing Businesses – Saudi Coalition Airstrikes on Yemen's Civilian Economic Structures (Accessed 14.3.19) <https://www.hrw.org/report/2016/07/11/bombing-businesses/saudi-coalition-airstrikes-yemens-civilian-economic-structures#>
- 255 [https://www.scribd.com/document/372556569/Final-Report-UN-Panel-of-Experts-Yemen-N-Security-Council-Letter-dated-26-January-2018-from-the-Panel-of-Experts-on-Yemen-mandated-by-Security-Council-resolution-2342-\(2017\)-addressed-to-the-President-of-the-Security-Council-U.N.Doc.S/2018/68-\(Jan.31,2018\)](https://www.scribd.com/document/372556569/Final-Report-UN-Panel-of-Experts-Yemen-N-Security-Council-Letter-dated-26-January-2018-from-the-Panel-of-Experts-on-Yemen-mandated-by-Security-Council-resolution-2342-(2017)-addressed-to-the-President-of-the-Security-Council-U.N.Doc.S/2018/68-(Jan.31,2018))
- 256 Raytheon Company (20.5.17): Raytheon and Saudi Arabia Military Industries announce strategic partnership. Cision. (Accessed 14.3.19) <https://www.prnewswire.com/news-releases/raytheon-and-saudi-arabia-military-industries-announce-strategic-partnership-300461082.html>
- 257 Freeman, S (2018): Who is arming the Yemen war? (And is anyone planning to stop?). World Peace Foundation. <https://sites.tufts.edu/reinventing-peace/2018/02/28/who-is-arming-the-yemen-war-and-is-anyone-planning-to-stop/>
- UK Parliament: Written Evidence from the Foreign and Commonwealth Office (UKY 13) <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/committees-on-arms-export-controls/use-of-ukmanufactured-arms-in-yemen/written/31698.html>
- 258 Reuters (25.11.15): UK-made cruise missile used in deadly airstrike on Yemeni factory: Rights groups (Accessed 14.3.19) <https://www.reuters.com/article/us-yemen-security-britain/uk-made-cruise-missile-used-in-deadly-air-strike-on-yemeni-factory-rights-groups-idUSKBN02E1L20151125>
- 259 Renae Dyer (10.7.17): BAE Systems dodges bullet as high Court throws out case to block arm sales to Saudi Arabia. Proactiveinvestors. (Accessed 14.3.19) <https://www.proactiveinvestors.co.uk/companies/news/180627/bae-systems-dodges-bullet-as-high-court-throws-out-case-to-block-arms-sales-to-saudi-arabia-180627.html>
- 260 Renae Dyer (10.7.17): BAE Systems dodges bullet as high Court throws out case to block arm sales to Saudi Arabia. Proactiveinvestors. (Accessed 14.3.19) <https://www.proactiveinvestors.co.uk/companies/news/180627/bae-systems-dodges-bullet-as-high-court-throws-out-case-to-block-arms-sales-to-saudi-arabia-180627.html>
- 261 Alice Ross (10.7.17): UK arms exports to Saudi Arabia can continue, high court rules. The Guardian. (Accessed 14.3.19) <https://www.theguardian.com/world/2017/jul/10/uk-arms-exports-to-saudi-arabia-can-continue-high-court-rules>
- 262 Human Rights Watch (2016): Bombing Businesses – Saudi Coalition Airstrikes on Yemen's Civilian Economic Structures (Accessed 14.3.19) [https://www.hrw.org/sites/default/files/report\\_pdf/yemen0716web.pdf](https://www.hrw.org/sites/default/files/report_pdf/yemen0716web.pdf) (page 55)
- 263 Armament Research Services (26.11.15): United Arab Emirates employ British Hakim A series precision guided munitions in Yemen (Accessed 14.3.19) <http://armamentresearch.com/united-arab-emirates-employ-british-hakim-a-series-precision-guided-munitions-in-yemen/>
- 264 Andrew Chuter (17.10.16): UK-supplied Precision Weapons Prove Popular in Saudi-Led Yemen Campaign. Defense News. (Accessed 14.3.19) <https://www.defensenews.com/global/2016/10/17/uk-supplied-precision-weapons-prove-popular-in-saudi-led-yemen-campaign/> and Written Evidence from the Foreign and Commonwealth Office (UKY13) <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/committees-on-arms-export-controls/use-of-ukmanufactured-arms-in-yemen/written/31698.html>
- 265 Alex Crawford (14.12.16): Yemen's rebel PM accuses UK of war crimes with Saudi arms sales. Sky News. (Accessed 14.3.19) <https://news.sky.com/story/yemens-rebel-pm-accuses-uk-of-war-crimes-with-saudi-arms-sales-10693334>
- 266 Samuel Perlo-Freeman (28.1.18): Who is arming the Yemen war? (And is anyone planning to stop?) World Peace Foundation. (Accessed 14.3.19) <https://sites.tufts.edu/reinventingpeace/2018/02/28/who-is-arming-the-yemen-war-and-is-anyone-planning-to-stop/>
- 267 Arms Trade Treaty (n.d.): Treaty Text (Accessed 14.3.19) <https://thearmstradetreaty.org/treaty-text.html?templateId=209884>
- 268 ICRC (2004): What is International Humanitarian Law? (Accessed 14.3.19) [https://www.icrc.org/en/doc/assets/files/other/what\\_is\\_ihl.pdf](https://www.icrc.org/en/doc/assets/files/other/what_is_ihl.pdf)
- 269 OHCHR (2011): Guiding principles on business and human rights (Accessed 14.3.19) [https://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR\\_EN.pdf](https://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf)
- 270 OHCHR (2017): OHCHR response to request from BankTrack for advice regarding the application of the UN Guiding Principles on Business and Human Rights in the context of the banking sector <https://www.ohchr.org/Documents/Issues/Business/InterpretationGuidingPrinciples.pdf>
- 271 Jake Evans, ABC News (28.02.19): The Australian Defence Force has invested more than \$5 billion in researching the possibilities of artificially intelligent weaponry in an effort to design ethical killing machines (Accessed: 16.04.19) <https://www.abc.net.au/news/2019-03-01/defence-force-invests-in-killer-artificial-intelligence/10859398>
- 272 Tass (05.07.17): Kalashnikov gunmaker develops combat module based on artificial intelligence (Accessed: 16.04.19) <http://tass.com/defense/954894>
- 273 xhtps://www.theaustralian.com.au/world/the-times/russian-company-kalashnikov-unveils-new-fire-and-forget-uav-suicide-drone/news-story/20c23fa2ee938ab15a433a51a-3fa93e
- 274 Redstar (2019): Под прикрытием идеального оружия <http://redstar.ru/pod-prikrityem-idealnogo-oruzhiya/>
- 275 Stephen Chen, South China Morning Post (22.07.18): China military develops robotic submarines to launch a new era of sea power (Accessed: 16.04.19) <https://www.scmp.com/news/china/society/article/2156361/china-developing-unmanned-ai-submarines-launch-new-era-sea-power>
- 276 Army Recognition (2019): AAD 2018: Chinese Ziyun Blowfish 1 unmanned helicopter armed with bombs [https://www.armyrecognition.com/aad\\_2018\\_news\\_official\\_online\\_show\\_daily/aad\\_2018\\_chinese\\_ziyun\\_blowfish\\_1\\_unmanned\\_helicopter\\_armed\\_with\\_bombs.html](https://www.armyrecognition.com/aad_2018_news_official_online_show_daily/aad_2018_chinese_ziyun_blowfish_1_unmanned_helicopter_armed_with_bombs.html)
- 277 Statista (2018) : Largest asset management companies worldwide as of September 2018, by managed assets (in trillion U.S. dollars), <https://www.statista.com/statistics/431790> (Accessed 14.03.2019)
- 278 BlackRock: Investor relations - BlackRock Reports Full Year 2018 Diluted EPS of \$26.58, or \$26.93 as adjusted Fourth Quarter 2018 Diluted EPS of \$5.78, or \$6.08 as adjusted. <http://ir.blackrock.com/Cache/1001247206.PDF?0=PDF&T=&Y=&D=&FID=1001247206&id=4048287> (Accessed 20.03.2019)
- 279 Principles for Responsible Investment (2018): BlackRock, PRI Reporting Framework 2018, <https://reporting.unpri.org/surveys/PRI-reporting-framework-2018/1#2be-fab38ad94134a78ae31a2c538353>; [https://reporting.unpri.org/surveys/PRI-reporting-framework-2018/1#6a739fe772e9496bb-cf556f4603976e2\\_1](https://reporting.unpri.org/surveys/PRI-reporting-framework-2018/1#6a739fe772e9496bb-cf556f4603976e2_1)
- 280 Principles for Responsible Investment (2018): BlackRock, PRI Reporting Framework 2018, <https://reporting.unpri.org/surveys/PRI-reporting-framework-2018/1#2be-fab38ad94134a78ae31a2c538353>
- 281 Smith, P (2019): BlackRock stakes claim on 'sustainable investing' revolution. Financial times. 23 Oct. <https://www.ft.com/content/f66b2a9e-d53d-11e8-a854-33d6f82e62f8>
- 282 Kirokorian, M (2019): Up in arms: \$6.8trn AM group steps up weapons exclusion efforts. Citywire Selector. <https://citywireselector.com/news/up-in-arms-6-8trn-am-group-steps-up-weapons-exclusion-efforts/a1199874>
- 283 Swiss Sustainable Finance (2018): SSF Engagement Initiatives: open letter to index providers on controversial weapons exclusions. [http://www.sustainablefinance.ch/en/engagement-initiatives\\_-\\_content---1--3117.html](http://www.sustainablefinance.ch/en/engagement-initiatives_-_content---1--3117.html)
- 284 United Nations Office for Disarmament Affairs. Treaty on the prohibition of nuclear weapons. <https://www.un.org/disarmament/wmd/nuclear/tpnw/>
- 285 PAX (2018): Worldwide Investments in Cluster Munitions: A Shared Responsibility, 32 <https://www.paxforpeace.nl/publications/all-publications/worldwide-investments-in-cluster-munitions-a-shared-responsibility-2017>
- 286 United Nations Office for Disarmament Affairs. Treaty on the prohibition of nuclear weapons. <https://www.un.org/disarmament/wmd/nuclear/tpnw/>
- 287 PAX, ICAN (2018): Don't Bank on the Bomb: A Global Report on the Financing of Nuclear Weapon's Producers. 70-71 <https://www.paxforpeace.nl/stay-informed/news/pax-report-more-investments-in-nuclear-weapon-producers>
- 288 "it is their money, not ours" (see <https://www.blackrock.com/corporate/newsroom/press-releases/article/corporate-one/press-releases/blackrock-approach-to-companies-manufacturing-distributing-firearms>) and "clients will still have the ability to buy elsewhere" (see Financial Times (2018): BlackRock stakes claim on 'sustainable investing' revolution)
- 289 Stefan Terliesner (2019): Wie Anbieter, Banken und Kunden automatisch Geld Verdienen (Accessed 18.4.19) [https://www.oeko.world.com/fileadmin/media\\_oekoworld/Bilder\\_fuer\\_Presse\\_News/2019/Bankmagazin\\_Fondsgesellschaften\\_Januar\\_2019.pdf](https://www.oeko.world.com/fileadmin/media_oekoworld/Bilder_fuer_Presse_News/2019/Bankmagazin_Fondsgesellschaften_Januar_2019.pdf)
- 290 StockWorld (1.3.18): Fondsmarkt Deutschland: So dominant sind die "Großen Vier" wirklich <http://www.stock-world.de/nachrichten/fonds/Fondsmarkt-Deutschland-So-dominant-sind-Grossen-Vier-wirklich-Fondsnws-n8432400.html> (Accessed 18.4.19)
- 291 Verbraucherzentrale Bremen (8.6.17): Anleger lehnen Waffen und Rüstung bei der Altersvorsorge ab (Accessed 18.4.19) <https://www.verbraucherzentrale-bremen.de/wissen/geld-versicherungen/nachhaltige-geldanlage/anleger-lehnen-waffen-und-ruestung-bei-der-altersvorsorge-ab-13727>
- 292 DWS (2019): Environmental Social Governance (Accessed 18.4.19) <https://dws.com/de-de/loesungen/esg/>
- 293 Allianz (2018): Active is: Verantwortungsbe-wusste Investieren (Accessed 18.4.19) <https://de.allianzgi.com/-/media/allianzgi/eu/regional-content/documents/de-de/responsible-investing-report-2018-german-digital-singles.pdf>
- 294 Deka (n.d.): Verantwortungsvolle Kapitalanlagen (Accessed 18.4.19) <https://www.deka.de/deka-gruppe/nachhaltigkeit/nachhaltige-produkte/geschaeftsfeld-wertpapier>
- 295 Union Investment (n.d.): Download-Center (Accessed 18.4.19) <http://union-investment.ch/startseite-com/Mediathek/Download-Center.html>
- 296 UN General Assembly (2013): Final United Nations Conference on the Arms Trade Treaty New York, 18-28 March 2013 <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/att/negotiating-conference-ii/documents/L3.pdf>
- 297 ICRC (2018): Autonomous Weapon Systems under International Humanitarian law. <https://www.icrc.org/en/document/autonomous-weapon-systems-under-international-humanitarian-law>
- 298 OECD (2017): Responsible business conduct for institutional investors: Key considerations for due diligence under the OECD Guidelines for Multinational Enterprises <https://mneguidelines.oecd.org/RBC-for-Institutional-Investors.pdf>
- 299 Shareaction (2017): Lifting the Lid: Responsible Investment Performance of European Asset Managers. <https://shareaction.org/wp-content/uploads/2017/03/Lifting-the-Lid-Responsible-Investment-Performance-of-European-Asset-Managers-2017.pdf>
- 300 McGrath, J (2018): Candriam to divest from coal, tobacco and weapons. ESG clarity. <https://esgclarity.com/candriam-to-divest-from-coal-tobacco-and-weapons/>
- 301 SIPRI (2019): 5 charts that reveal the state of the global arms trade. 14 March. World Economic Forum. <https://www.weforum.org/agenda/2019/03/5-charts-that-reveal-the-state-of-the-global-arms-trade/>

**Berlin, May 2019:**

Facing Finance e.V. calls on investors to divest from companies benefitting from human rights violations, environmental destruction, corruption, and/or the production and export of controversial weapons. Facing Finance strives to achieve the highest level of accuracy in its reports. However, the overall lack of transparency in many controversial sectors produces gaps in publicly available information. Therefore, the information in this report reflects all publicly available sources of official information known to Facing Finance, partner organizations, and its researchers. If you believe you have found an inaccuracy in our report or if you wish to provide additional information, please contact us at [kontakt@facing-finance.org](mailto:kontakt@facing-finance.org)

---

**Responsible Publisher:**

Thomas Küchenmeister, Managing Director, Facing Finance e.V.,  
Schönhauser Allee 141, Hinterhaus 2, D-10437 Berlin

---

**Authors and researchers:**

Susanne Zander  
Lucy Banisch  
Hélène Sturny  
Vanessa Müller  
Richard Buch  
Carla Bilson  
Sarah Guhr  
Julia Dubsclaff  
Barbara Happe  
Thomas Küchenmeister

---

**Special Thanks to:**

Daan Kayser, Pax and Barbara Happe, urgewald

---

**Project co-ordination and Editing:**

Lesley Burdock

---

**Layout:**

Ole Kaleschke Gestaltung, Berlin — [www.olekaleschke.de](http://www.olekaleschke.de)

---

**A publication by:**

Facing Finance e.V. is listed at the district court Berlin-Charlottenburg in the register of associations as No. VR 32177B-1 and is accredited as a non-profit organization.

---

**Funded by:**



**With support from:**

**Kindernothilfe-Stiftung**



A publication by



[www.facing-finance.org](http://www.facing-finance.org)