2016-2022

Belgium Homeland Security & Public Safety Market



Homeland Security Research Corp.

2 Volumes

Belgium Homeland Security & Public-Safety Market 2016-2022 -Volume 1

Belgium Homeland Security & Public-Safety Market 2016-2022 -Volume 2

2016-2022

Belgium Homeland Security & Public Safety Market Volume 1



Homeland Security Research Corp.

Belgium Homeland Security & Public-Safety Market

Volume 1

2016-2022

May 2016

Homeland Security Research Corp. (HSRC) is an international market and technology research firm specializing in the Homeland Security (HLS) & Public Safety (PS) Industry. HSRC provides premium market reports on present and emerging technologies and industry expertise, enabling global clients to gain time-critical insight into business opportunities. HSRC's clients include U.S. Congress, DHS, U.S. Army, U.S. Navy, NATO, DOD, DOT, GAO, and EU, among others; as well as Counter Terror & PS government agencies in Japan, Korea, Taiwan, Israel, Canada, UK, Germany, Australia, Sweden, Finland, Singapore. With over 750 private sector clients (72% repeat customers), including major defense and security contractors, and Fortune 500 companies. HSRC earned the reputation as the industry's Gold Standard for Counter Terror & PS market reports.

Washington D.C. 20004, 601 Pennsylvania Ave., NW Suite 900, Tel: 202-455-0966, info@hsrc.biz, www.homelandsecurityresearch.com

Acknowledgements

The authors of this report wish to convey their sincere thanks to all of the Counter Terror & Public Safety planners, engineers, scientists, security personnel, government officials, vendors, distributors and users, who granted us interviews, sent us their publications, provided us with non-published presentations, reviewed and commented on our drafts - giving us an invaluable insight into the working of technologies markets and trends. The list below contains the names of some of the people who have helped us directly or indirectly in the preparation of this report. We thank them and many others.

Jorge Domecq, Chief Executive of the European Defence Agency (EDA). Carl Bildt, Former Swedish Prime Minister and Minister of Foreign Affairs and Trustee of Friends of Europe. Ana Gomes, Member of the European Parliament, Committee on Civil Liberties, Justice and Home Affairs and on the Subcommittee on Security and Defence. Ian Bremmer, President and Founder of Eurasia Group. Elisabeth Guigou, President of the Foreign Affairs Commission of the French National Assembly, President of Anna Lindh Foundation and Trustee of Friends of Europe. Lock Pin Chew, Director of the Risk Assessment and Horizon Scanning Programme Office of Singapore's National Security Coordinating Secretariat. Peter Hultqvist, Swedish Minister of Defence. Luis De Almeida Sampaio, Portuguese Permanent Representative of Portugal to NATO. Wolfgang Ischinger, Chairman of the Munich Security Conference and former German Ambassador to the U.S. Jaap De Hoop Scheffer, Former NATO Secretary General and Trustee of Friends of Europe. Elizabeth Johnston. Executive Director of the European Forum for Urban Security. Marina Kaljurand, Estonian Minister of Foreign Affairs. Joanne Liu, International President of Medecins sans Frontieres (MSF). Mara E. Karlin, U.S. Deputy Assistant Secretary of Defense for Strategy and Force Development. Frederica Mogherini, High Representative of the Union for Foreign Affairs and Security Policy and Vice-President of the European Commission. Irene Khan, Director General of the International Development Law Organization and Former Secretary General of Amnesty International. Bert Koenders, Dutch Minister of Foreign Affairs. General Mikhail Kostarakos, Chairman of the European Union Military Committee (CEUMC). Baroness Pauline Neville-Jones, Member of the UK House of Lords and former Minister of State for Security and Counter-Terrorism. Thomas Gottschild, Director for EU & NATO Policies, Cassidian. Colonel Henry Neumann. Group Leader of CBRN Protection, Fire and Self Protection, German Armed Forces. Lieutenant Colonel Brian Clesham, HQ Land Command, Ministry of Defence, UK. Pentti Partanen, Director General, Finnish Department of Rescue Services. John Conaghan, Police Inspector, British Transport Police. Colonel Frank Kämper, Project Officer Protection, Capability Directorate, European Defence Agency. Gayle Gorman and Jamie Campbell, Eclipse Ventures. Lars Kjaer, World Shipping Council. John Avolio, Director, Security & Detection Systems, L3 Communications. Ted Strancyek, President, Aircraftsmen & Associates. Dore S. Perler, President & CEO, Sense Holding Inc. James T. Ryan, General Manager, Cantronic Ethnologies. M. Peretz, Executive Vice President, Integrated Detection Systems. Richard Doubrava, Managing Director of Security, Air Transport Association. Marian Terlecki, Manager, Cargo Security and ULD Industry Distribution & Financial Services, International Air Transport Association (IATA). Raphael Kahn, Director Secure, Marine. Tony Magnusson, Acting Head of Anti-Smuggling Division, National CSI coordinator, Swedish Customs. Nadège Grard, Assistant European Organisation for Security (EOS). Pavel Adam, Institute of Photonics and Electronics, Czech Republic. Ralph Hammer, Expert, National and European Security Research, Ministry of Transport, Innovation and Technology, Austria. Charles Elsen, Former Council of the European Union. Jean-Louis de Brouwer, European Commission. Audrey Baneyx, Sciences-Po Paris Médialab. Benoit Verjat, Sciences-Po Paris Médialab. Peter Jozsef Csonka, European Commission. Wenceslas de Lobkowicz, Former European Commission, Sciences Po Paris. Médéric Martin-Mazé, King's College, London. Tony Venables, Former European Citizen Action Service. Kees Groenendijk, University of Nijmegen. Beate Winkler, Author, former Director of the EU Agency in Vienna, now FRA, Fabrice Leggeri, Frontex, Elspeth Guild. University of Nijmegen, CEPS. Wouter Van De Rijt, Council of the European Union. Emilio de Capitani, Former European Parliament. Michael Kennedy, Eurojust. Petra Bard, Central European University. Willy Bruggeman, Europol. Monica den Boer, SeQure Research and Consultancy, Vrije Universiteit, Amsterdam. Johannes Vos., Former Council of the European Union. Peter Hustinx, Former European Data Protection Supervisor. Julien Jeandesboz, Université Libre de Bruxelles. Sandra Nunes, eu-LISA. Sharon Abbas, Business Development Manager Raytheon International, Europe. Nicolas D. Loannidis, Managing Director, Patras Port Authority, S.A. Anthony Comber, Sales and Marketing Manager, Thales Navigation Limited. Steven D. Botello - Director, Cargo Sales, Rapiscan Security Products. Jiří Homola, Institute of Photonics and Electronics. Czech Republic. Marek Piliarik. Institute of Photonics and Electronics, Czech Republic, Prague. Jianping Yao, Microwave Photonics Research Laboratory, Canada. Philip Anderson, Senior Fellow Homeland Security Initiatives, CSIS Center For Strategic & International Studies. Dale K. Kotter, Scientist, National Security -INEEL. Jerry Peck, Global Trade Management Solutions. Mike Bohlman, Horizon Lines and ISO TC 104. Charlie Piersall, ISO TC. Daniel Colonel Fred Hilpert, Director, Transformation Support, Joint CBRN Defence Centre of Excellence, Czech Republic. Bill DeWitt, SSA. Susan F. Hallowell, Ph.D., Director of Technology. Jerry W. McElwee, Vice President, Joint Programs, Boeing. Eric R. Schwartz, Director, Advanced Systems Technology Phantom Works, Boeing. Patrick OSZCZEDA, VP Counter Terror, Thales Group. Bruce Aitken, President. Homeland Security Industries Association (HSIA). R. Barry Ashby, President, Ashby & Associates. Rodney E. Thomas, CEO, Thomas & Herbert Consulting LTC. John C. Carrano, Ph.D., Program Manager Microsystems Technology Office, Defense Advanced Research Projects Agency. Mark J. Rosker, Ph.D., Program Manager, DARPA. John M. Libert, Physical Scientist, Display Metrology, Forensic Imaging, Department of Commerce National Institute of Standards and Technology Electronics and Electrical Engineering Laboratory of NIST. Tomáš Springer, Institute of Photonics and Electronics, Czech Republic. Milan Vala, Institute of Photonics and Electronics, Academy of Sciences of the Czech Republic, Prague. Benjamin R. Watts, Department of Engineering Physics, McMaster University. Tomasz Wolinski, Faculty of Physics, Warsaw University of Technology. Chang-Qing Xu, Department of Engineering Physics, McMaster University. Brig. Gen (Res.) Dani Arditi, Fmr. Director Israel National Security Council. Giorgio Abrate, Senior Vice President. Avio Olav Adami, Strategic Relations Luciad Col (GS). Thomas Ahammer, Deputy Military Representative Permanent Representation of Austria to the EU. Frank Amedick, Global Account Manager, NATO Siemens Belgium. Paul Ames, Freelance Journalist. Jacqueline Argence, Solution Portfolio Management Director, Cassidian. Aviel Atias, Consultant Mind-Alliance Systems, LLC. Fabio Bagnoli, Division Manager, D'appolonia. Paul Baker, Director/Associate Consultant Baker, R&C/Ecorys. Gary Bamford, Director, Arcadis Vectra. Alain Barbier, Deputy Special Representative to the European Union, International Criminal Police Organization (INTERPOL). Dan Baxter, Senior Vice-President and Director, Fleishman-Hillard. Jacquelyn Bednarz,

Attaché, Department of Homeland Security Mission of the United States of America to the EU. Emanuela Bellan, Head of Unit, Crisis Management European Commission General Secretariat. Juliette Bird, First Secretary, Security and Terrorism Permanent Representation of the United Kingdom to the EU. Ivan Bizjak, Director General for Justice and Home Affairs Council of the European Union. David Blackwell, Director for Cybersecurity DETICA (BAE Systems). Christian Blobner, Project Manager, Logistics and Factory Systems, Fraunhoffer Institute for Factory Operation and Automation IFF. Agnes Borg, Assistant, Weber. Shandwick Martin Borrett, Director, IBM Institute for Advanced Security. John Brading, Deputy BD Director, National Security, Raytheon, UK. Simon Busuttil, European Parliament. Geert Cami, Co-Founder & Director, Security & Defence Agenda (SDA). Genseric Cantournet, Vice President, Security Cross-Processes and Projects Telecom Italia. Patrice Cardot, Conseiller, Ministry of Defence, France, Direction Générale de l'Armement (DGA). Valentina Carletti, Advisor for EU, EDA and NATO affairs, Selex Sistemi Integrati. Albert Caruana, Information Assurance Officer, Council of the European Union. Claudio Catalano, Analyst, Studies Division, Finmeccanica, UK. Marc Cathelineau, Vice President, European Union & NATO Affairs, Thales. Inge Ceuppens, Project Officer, European Commission, DG for Information Society & Media. Jacques Cipriano, Vice President, European Affairs, Safran Group. Michael Clarke, Public Affairs Director, G4S. Robert Cox, Trustee, Friends of Europe. Eugenio Creso, Institutional Relations Director, Selex Sistemi Integrati S.p.A. Vincenzo Cuomo, Professor, Italian National Research Council (CNR). Charles de Couessin General Manager, ID Partners. Dennis Davis, Vice President, International Association of Fire and Rescue Services (CTIF). Jean-Louis de Brouwer, Director for Migration and Borders, European Commission, DG for Home Affairs. Gilles de Kerchove, European Counter-Terrorism Coordinator, Council of the European Union. Kirsten de Haan, Research Assistant, Fleishman-Hillard. Stanislas de Maupeou, Director for Cyber-Defence, Thales. Eva Diaz Perez, EADS Key Account NATO/EU, European Aeronautic Defence and Space Company (EADS). Anatoly Didenko, Counsellor, Mission of the Russian Federation to the EU. Claes Dorien, Office Manager, European Corporate Security Association (ECSA). Michael T. Dougherty, Director of Immigration Control, Raytheon. Jonathan Dowdall, Policy Analyst & Market Development, Security Europe. David Henry Doyle, Security & Defence Advisor, YPFP Brussels. Anna Katarzyna Dubowik, Secretary, Permanent Representation of Poland to the EU. H.E. Mr. Dumitru Sorin Ducaru, Ambassador, Delegation of Romania to NATO. Krzysztof Durczak, Key Account Manager, Defence & Security Sector, Thales. Eeva Eek-Pajuste, Counsellor, Political Affairs, Permanent Representation of Estonia to the EU. Sabine Ehmke-Gendron. Director for Civil Protection and Disaster Management. Council of the European Union. Ludwig Eickemeyer, Corporate Sales Executive, European Voice. Gamze Erdem, Advisor, Turkish Industry and Business Association, (TÜSIAD). Anu Eslas, Programmes Coordinator, Estonian Atlantic Treaty Association. Henning Faltin, Deputy Branch Head, European Union Military Staff (EUMS). David Fairnie, Director of Global Port Solution, G4S. Patsy Faynsztein, Manager, EU Business Development, Raytheon International, Europe. Maria Fialho, Special Advisor, Transatlantic Relations, European Parliament. Ulrich Fikar, Assistant to Zoltàn Martinusz, European Council Cabinet of President Herman Van Rompuy. Theodor Fokken, Director, Business Development EU-NATO, Rohde & Schwarz. Pierre-Alain Fonteyne, Chairman of the IMG-S Security Research Roadmap (SRR), Catholic University of Louvain. Roger Forsberg, Chief Information Security Officer, Swedish Fortifications Agency. Ulrike Freyert, Policy Officer, Justice and Interior Representation of Brandenburg to the EU. Octávia Frota, Senior Advisor, Conrad International. Marino Gallego, Innovation Business Director, Everis. Hugo Ganet-Sénoko, Senior Manager, Indra. Jim Gaudoin, Managing Director, L-3 Communication Systems Security & Detection Systems Division. Antoine Gérard, Head of the Brussels Liaison Office, United Nations Office for the

Coordination of Humanitarian Affairs (UNOCHA). Andrea Ghianda, Project Manager, Security & Defence Agenda (SDA). Pierluigi Massimo Giansanti, Director, NATO/EU Sales Department, Selex Sistemi Integrati, S.p.A. Bill Giles, Director General Europe, BAE Systems. Laurent Giquello, French National Expert, NATO Air Command and Control System Management Agency (NACMA). Lt. Gen. Jo Godderij, Director, NATO International Military Staff (IMS). Timo Harkonen, Director of Government Security, Office of the Prime Minister, Finland. Michael Hartinger, Project Officer, Capability Development Planning, European Defence Agency (EDA). Robert Havas, Chairman, Board of Directors, European Organization for Security (EOS). Rear Admiral Giorgio Lazio, Chief of Staff Maritime Command, NATO. James A. Lewis, Director and Senior Fellow of the Strategic Technologies Program of the Center for Strategic and International Studies (CSIS). Michael Printzos, Programme Director of The Hellenic Initiative. Lee Litzenberger, U.S. Deputy Permanent Representative to NATO. Didier Reynders, Belgian Deputy Prime Minister and Minister of Foreign Affairs and European Affairs. Katrin Suder, German Secretary of State at the Ministry of Defence. Carne Ross, Executive Director of Independent Diplomat. Sir Adam Thomson, UK Permanent Representative to NATO. Michael Roth, German Minister of State for Europe. Marietje Schaake, Member of the European Parliament, Vice-Chair of the Delegation for Relations with the United States, Member of the Committee on International Trade. Waldemar Very, Deputy Special Representative for the Rule of Law at the United Nations Mission in Liberia (UNMIL). Marriet Schuurman, NATO Special Representative. Catherine Woollard, Secretary General of the European Council on Refugees and Exiles (ECRE). Jamie Shea, NATO Deputy Assistant Secretary General for Emerging Security Challenges. Maria zakharova, Spokesperson of the Russian Ministry of Foreign Affairs. Julianne smith, Senior Fellow and Director of the Strategy and Statecraft Program at the Center for a New American Security (CNAS). Lamberto Zannier, Secretary General of the Organization for Security and Co-operation in Europe (OSCE). Javier Solana, Former NATO Secretary General and EU High Representative for CSDP and Trustee of Friends of Europe.

Table of Contents

1	Summary		
2	Belgium Homeland Security & Public-Safety: Market Background		
3	Terro 3.1 3.2	r Challenges Terror Attack Statistics Brussels March 2016 Terror Attacks	27
4	Belgi	um Crime-Related Security Market Background	35
5	Belgi 5.1 5.2	um Terror Threats & Counter Terror Strategy The New Realities of Terror Terror & Counter Terror Policy	36
6	Belgio 6.1 6.2 6.3 6.4	wm Homeland Security & Public Safety Market SWOT Analysis Strengths Weaknesses Opportunities Threats	41 42 43
7	Key V	endors	45
8	8.1	Source	46 46 47 48
	8.2 8.2 8.3 8.3	.1 2015 Market Data & 2016-2022 Market Forecast by Vertical Sub-Markets	49 51 52
VER	TICAL	MARKETS	54
9	Belgi	um Airport Security Market - 2016-2022	54
	9.1	Market Definition	54
	9.2	Overview	
	9.3	Aviation Security Threats	55

	9.4 Avia	tion Cybersecurity	56
	9.5 Belg	ium Aviation Security: Market Background	57
		ium Airports Screened Passengers Statistics	
	9.7 Avia	tion Security Screening Technologies	59
	9.7.1	X-ray Screening	59
	9.7.2	Explosive Detection Systems (EDS)	59
	9.7.3	Explosives Trace Detection (ETD)	59
	9.7.4	Biological, Radioactive and Nuclear Detection System	
	9.7.4.1	Millimeter Wave Imaging Systems	
	9.7.5	Freight Forwarders	
	9.7.6	Customs	60
	9.7.7	Aviation Passenger Screening Technologies Outlook: 2014-2022	61
	9.7.8	Checked Baggage Screening Market	
	9.7.9	Counter-MANPAD Market	
	9.8 Air C	Cargo Screening Technologies & Markets	
	9.8.1	Air Cargo Outlook	
	9.8.2	Air Cargo Related Security Risks	
	9.8.3	Air-Cargo Supply Chain Security	64
	9.8.4	Airport Perimeter Security Technologies & Markets	64
	9.8.5	Belgium Aviation Security Market Business Opportunities &	
	0.0 D.L.	Challenges	
		ium Airport Security Market - 2015-2022	65
	9.9.1	Market Size & Dynamics - 2015-2022	
	9.9.2	Market Breakdown	00
10		mart Border, Immigration Enforcement & Border Security	
)16-2022	
		cet Definition	
		ket-Background	
		ation to Belgium	
	10.3.1	Belgium Immigration Data	
	10.3.2	•	
	10.3.3	Belgian E-Passport	
	10.3.4	Belgium Immigration Legislation	
	10.3.5	Automated Border Control (ABC) Gates	
	10.3.6	Automated Passport Control Gates	
	10.3.7	Immigration Enforcement	
		ium Border Security	
		ium Smart Borders, Immigration Enforcement & Border Security set – 2015-2022	
	10.5.1	Market Size & Dynamics - 2015-2022	
	10.5.1	Market Breakdown	
	10.5.2	IVIAINGE DIGARUUWII	/ /

11	Belgium Counter-Terror & Counter Crime Intelligence Agencies Market	
	– 2016-2022	78
	11.1 Market Definition	
	11.2 Belgium Intelligence Agencies: Market Background	
	11.3 Anti-terror intelligence industry Business Opportunities & Challenges	79
	11.4 Belgian Intelligence Agencies	82
	11.4.1 State Security Service	
	11.4.2 General Information and Security Service	82
	11.5 Belgium Counter-Terror & Counter Crime Intelligence Agencies	
	Market – 2015-2022	
	11.5.1 Market Size & Dynamics - 2015-2022	
	11.5.2 Market Breakdown	85
12	Belgium Critical Infrastructure Protection Market - 2016-2022	86
	12.1 Market Definition	
	12.2 Belgium Critical Infrastructure Protection: Market Background	87
	12.3 Belgian Nuclear Plants Security	91
	12.4 Planning of Infrastructure Security	93
	12.5 Information Sharing with the Private Sector	94
	12.6 Critical Infrastructure Security Market: Business Opportunities	95
	12.7 Critical Infrastructure CBRN Security	
	12.8 Critical Infrastructure Cybersecurity Strategy	97
	12.9 Belgium CIP Standards and specifications	
	12.10 Belgium Critical Infrastructure Protection Market -2015-2022	99
	12.10.1 Market Size & Dynamics - 2015-2022	99
	12.10.2 Market Breakdown	101
13	Belgium Police Modernization & Other 1st Responders Market - 2016-	
	2022	102
	13.1 Market Definition	102
	13.2 Belgian Police Forces	103
	13.2.1 Belgium Federal Police	
	13.2.2 Belgium Local Police Forces	104
	13.3 Belgium 1 st Responders, Firefighters & Emergency Medical Services	105
	13.4 Police Modernization & 1st Responders Market	
	13.4.1 Belgium Police Modernization & 1st Responder Business	
	Opportunities	109
	13.5 Belgium Police Modernization & Other 1st Responders Market -	
	2015-2022	110
	13.5.1 Market Size & Dynamics - 2015-2022	110
	13.5.2 Market Breakdown	112
14	Belgium Safe City & Public Events Security Market - 2016-2022	113
	14.1 Market Definition	
	14.2 Safe City: Background	
	14.2.1 The Private Sector Public Events Security	
		116

	14.2.3	Perimeter Security	116
	14.2.4	Public Events Infrastructure Security	117
	14.2.5	Public Events Emergency Services	
	14.2.6	Public Events WMD and Hazmat Detection and Response	
		Market	
	14.2.6.1		
	14.2.6.2	Threat level	119
	14.2.7	Belgium Public Events Security Market: Business	
		Opportunities & Challenges	119
	14.3 Belgii	um Safe City & Public Events Security Market - 2015-2022	120
	14.3.1	Market Size & Dynamics - 2015-2022	120
	14.3.2	Market Breakdown	122
15	Relaium Ru	ildings & Perimeter Security Market – 2016-2022	123
13	15.1 Marke	et Definition	123
		ings & Perimeter Security Technologies and Market	
	15.2.1		
	15.2.2		
		um Building & Perimeter Security Market – 2015-2020	
	15.3.1		
	15.3.2	Market Breakdown	
4.0			
16	Belgium CE	BRN Security & Safety Market – 2016-2022	128
		et Definition	
		ological-Nuclear Detection Technologies	
		nical Agents Detection Technologies	
		gical Agents Detection Technologies	
		EU CBRN Terror Mitigation Actions	
		N Mitigation Market overview	
		EU CBRN Risk Mitigation Centers of Excellence	
	16.9 Belgi	et-Backgroundum CBRN Security & Safety Market- 2015-2022	127
	16.9.1	Market Size & Dynamics - 2015-2022	
		Market Breakdown	
17		her Homeland security & Public Safety Vertical Markets	
	2016-2022		
		me Security Market	
	17.1.1	European Border and Coast Guard	
	17.1.2	Satellite Based Maritime Tracking	
	17.1.3	Wide Area Communications and Tracking Technology	
	17.1.4	SkyBitz Global Locating System	
	17.1.5	PAR Cargo*Mate	
	17.1.6	TRI-MEX "Black Box"	
	17.1.7	Maritime Awareness Global Network (MAGNET)	
	17.1.8	Piracy Mitigation	144

17.2	Belgi	um Mass Transportation Security Market	144
		r Homeland security & Public Safety Vertical Markets – 2015-	
		, , , , , , , , , , , , , , , , , , ,	145
17.		Market Size & Dynamics - 2015-2022	
17.	3.2	Market Breakdown	147

List of Tables

Table 1 - Belgium Facts & Figures	17
Table 2 - Belgium Homeland Security & Public Safety Market [\$M] and AGR [%] – 2015-2022	18
Table 3 - Belgium Homeland Security & Public Safety Market [\$M] by Revenue Category – 2015-2022	46
Table 4 - Belgium Homeland Security & Public Safety Market AGR [%] by Revenue Category – 2015-2022	48
Table 5 - Belgium Homeland Security & Public Safety [\$M] by Vertical Markets – 2015-2022	49
Table 6 - Belgium Homeland Security & Public Safety [\$M] by Vertical Markets – 2015-2022	51
Table 7 - Belgium Homeland Security & Public Safety Technology Markets [\$M] – 2015-2022	53
Table 8 - Belgium Passenger Screening [M] by 5 Airports	58
	65
Table 10 - Belgium Airport Security Market [\$M] (incl. Sales, Aftersale and Other Revenues) and AGR [%] – 2015-2022	65
Table 11 - Migrant Stock in Belgium by Country of Origin	
Table 12 - Belgium Smart Borders, Immigration Enforcement & Border Security	70
Market [\$M] (incl. Sales, Aftersale and Other Revenues) and AGR [%] – 2015-2022	76
Table 13 - Counter Terror & Crime Intelligence Market: Business Opportunities	81
Table 14 - Belgium Counter-Terror & Counter Crime Intelligence Agencies	
Market [\$M] (incl. Sales, Aftersale and Other Revenues) and AGR [%] – 2015-2022	83
Table 15 - Critical Infrastructure Security Market: Business Opportunities by	0.5
Technology	95
Table 16 - Critical Infrastructure Security Sub-markets Growth Outlook	95
Table 17 - Belgium Critical Infrastructure Protection Market [\$M] (incl. Sales,	00
Aftersale and Other Revenues) and AGR [%] – 2015-2022	99
Table 18 - Ranking of Manmade & Natural Disasters, Crime and Terror Threats as a Market Driver	109
Table 19 - Belgium Police modernization & 1st Responder Market: Business	100
Opportunities	109
Table 20 - Belgium Police Modernization & Other 1st Responders Market [\$M]	
(incl. Sales, Aftersale and Other Revenues) and AGR [%] – 2015-	
2022	110
Table 21 - Threat Level Definitions	119
Table 22 - Belgium Public Events Security Market: Business Opportunities	
Sectors	119
Table 23 - Belgium Public Events Security & Safe City Market [\$M] (incl. Sales,	
Aftersale and Other Revenues) and AGR [%] – 2015-2022	120

Table 24 - Belgium Building & Perimeter Security Market [\$M] (incl. Sales,	
Aftersale and Other Revenues) and AGR [%] – 2015-2022	125
Table 25 - Belgium CBRN Security & Safety Market [\$M] (incl. Sales, Aftersale	
and Other Revenues) and AGR [%] – 2015-2022	137
Table 26 - Belgium Other Homeland Security & Public Safety Vertical Markets	
[\$M] (incl. Sales, Aftersale and Other Revenues) and AGR [%] -	
2015-2022	145

List of Figures

Figure 1 - Belgium Market Report Organogram	17
Figure 2 - Belgium Counter Terror & Public Safety Agencies Organogram	
Figure 3 - Belgium Homeland Security & Public Safety Market [\$M] - 2015-2022	
Figure 4 - Number of Jihadists in Belgium vs. Other European Countries	24
Figure 5 - Map of March Terror Attacks in Brussels	28
Figure 6 - The Brussels Airport Terror Attack	31
Figure 7 - European Terror Attacks Timeline- 1980-April 2016	32
Figure 8 - ISIS Foreign Fighter per 1 Million Population Belgium Vs Other	
Countries	32
Figure 9 - The Brussels Metro Station Terror Attack	33
Figure 10 - The Terror Group Brussels – Paris Links	34
Figure 11 - Europe Major Terror Attacks-2001 to March 2016	37
Figure 12 - Percentage of Belgium Muslim Population Vs. Other EU Countries	38
Figure 13 - Belgium Homeland Security & Public Safety Market [\$M] by Revenue Category – 2015-2022	47
Figure 14 - Belgium Homeland Security & Public Safety Market Shares [%] by	41
Revenue Category – 2015-2022	48
Figure 15 - Belgium Homeland Security & Public Safety [\$M] by Vertical Markets	+0
– 2015-2022	50
Figure 16 - Belgium Homeland Security & Public Safety Vertical Market Shares	00
[%] – 2015-2022	52
Figure 17 - Belgium Aviation Security Layers	
Figure 18 - Airport Passengers Screening – Segments	
Figure 19 - Belgium Airport Security Market Share [%] by Revenue Category –	
2015-2022	66
Figure 20 - An Automatic Border Control (ABC) Gate	72
Figure 21 - Belgium Smart Borders, Immigration Enforcement & Border Security	
Market [\$M] by Revenue Category (Sales, Aftersale and Other	
Revenues) – 2015-2022	76
Figure 22 - Belgium Smart Borders, Immigration Enforcement & Border Security	
Market Share [%] by Revenue Category – 2015-2022	77
Figure 23 - Belgium Counter-Terror & Counter Crime Intelligence Agencies	
Market [\$M] by Revenue Category (Sales, Aftersale and Other	
Revenues) – 2015-2022	84
Figure 24 - Belgium Counter-Terror & Counter Crime Intelligence Agencies	
Market Share [%] by Revenue Category – 2015-2022	
Figure 25 - Critical Infrastructure Security, Layers of Security	
Figure 26 - Hierarchy of Critical Infrastructures	
Figure 27 - Belgium Critical Infrastructure Investment Priorities Scheme	
Figure 28 - Belgium Nuclear Reactors	91
Figure 29 - Belgium Critical Infrastructure Protection Market [\$M] by Revenue	
Category (Sales, Aftersale and Other Revenues) – 2015-2022	.100

Figure 30 - Belgium Critical Infrastructure Protection Market Share [%] by Revenue Category – 2015-2022	101
Figure 31 - Future 1st Responders Communications Services	101
Figure 32 - First Responders' Mobile Devices Network	107
· ·	100
Figure 33 - Belgium Police Modernization & Other 1st Responders Market [\$M]	
by Revenue Category (Sales, Aftersale and Other Revenues) –	444
2015-2022	111
Figure 34 - Belgium Police Modernization & Other 1st Responders Market Share	440
[%] by Revenue Category – 2015-2022	112
Figure 35 - Safe City ICT Flow	115
Figure 36 - Belgium Public Events Security & Safe City Market [\$M] by Revenue	404
Category (Sales, Aftersale and Other Revenues) – 2015-2022	121
Figure 37 - Belgium Public Events Security & Safe City Market Share [%] by	
Revenue Category – 2015-2022	122
Figure 38 - Belgium Building & Perimeter Security Market [\$M] by Revenue	
Category (Sales, Aftersale and Other Revenues) – 2015-2022	126
Figure 39 - Belgium Building & Perimeter Security Market Share [%] by Revenue	
Category – 2015-2022	127
Figure 40 - EU Chemical CBRN Risk Mitigation Centers of Excellence Members	
Figure 41 - EU Chemical CBRN Risk Mitigation Centers of Excellence Statistics	135
Figure 42 - Belgium CBRN Security & Safety Market [\$M] by Revenue Category	
(Sales, Aftersale and Other Revenues) – 2015-2022	138
Figure 43 - Belgium CBRN Security & Safety Market Share [%] by Revenue	
Category – 2015-2022	139
Figure 44 - The EU Maritime "Border"	141
Figure 45 - Belgium Other Homeland Security & Public Safety Vertical Markets	
[\$M] by Revenue Category (Sales, Aftersale and Other Revenues)	
– 2015-2022	146
Figure 46 - Belgium Other Homeland Security & Public Safety Vertical Markets	
Share [%] by Revenue Category – 2015-2022	147

2016-2022

Belgium Homeland Security & Public Safety Market

Volume 2



Homeland Security Research Corp.

Belgium Homeland Security & Public-Safety Market

Volume 2

2016-2022

May 2016

Homeland Security Research Corp. (HSRC) is an international market and technology research firm specializing in the Homeland Security (HLS) & Public Safety (PS) Industry. HSRC provides premium market reports on present and emerging technologies and industry expertise, enabling global clients to gain time-critical insight into business opportunities. HSRC's clients include U.S. Congress, DHS, U.S. Army, U.S. Navy, NATO, DOD, DOT, GAO, and EU, among others; as well as Counter Terror & PS government agencies in Japan, Korea, Taiwan, Israel, Canada, UK, Germany, Australia, Sweden, Finland, Singapore. With over 750 private sector clients (72% repeat customers), including major defense and security contractors, and Fortune 500 companies. HSRC earned the reputation as the industry's Gold Standard for Counter Terror & PS market reports.

Washington D.C. 20004, 601 Pennsylvania Ave., NW Suite 900, Tel: 202-455-0966, info@hsrc.biz, www.homelandsecurityresearch.com

Table of Contents

TEC	CHNOLOGY	MARKETS	16
1	Belgium C	Sybersecurity Market – 2015-2022	16
		pe	
		gium Cybersecurity Technologies: Market Background – 2015-	
		2	16
	1.2.1	European Cybersecurity Landscape - 2016	
	1.2.2	EU Threat taxonomy	
	1.2.3	Cybersecurity Strategy: Recent Conclusions	22
	1.2.4	Business Related Cybersecurity: Recent Conclusions	
	1.2.5	Cyber Terror & Crime	
	1.2.6	Cyber Warfare	24
	1.2.7	Denial of Service	25
	1.2.8	Deliberate Manipulation of Information	25
	1.2.9	Detection of Unauthorized Activity	
	1.2.10	Anti-Malware Cyber-Security	26
	1.3 Belg	gium Cybersecurity Strategy	27
	1.3.1	Privacy Enhanced Technologies (PETs)	28
		Cybersecurity Vendors	29
	1.5 Belg	gium Cybersecurity: Business Opportunities	30
	1.6 Belg	gium Cybersecurity Market – 2015-2022	31
	1.6.1	Market Size & Dynamics - 2015-2022	31
	1.6.2	Market Breakdown	33
2	Belgium F	Iomeland Security & Public Safety IT Market – 2016-2022	34
_		pe	
		rmation Technologies (w/o Intel & Cyber)	
		Inter Terror & Public Safety: Data Center Systems	
	2.3.1	Overview	
	2.3.2	Counter Terror and Public Safety: Data Center Services	
	2.3.3	Counter Terror and Public Safety: Support Services	
	2.3.4	Counter Terror and Public Safety: Technical Consulting	
		Services	36
	2.3.5	Outsourcing Services	37
	2.3.6	Application Services	37
	2.4 Cou	Inter Terror and Public Safety: Enterprise Software	
		Inter Terror and Public Safety: IT Services	
	2.5.1	Counter Terror and Public Safety Agencies: Cloud Storage &	
		Computing	39
	2.6 Inte	lligence Agencies IT	
	2.6.1	Introduction	
	2.6.2	Intelligence Community Software as a Service (SaaS)	
	2.6.3	Platform as a Service (PaaS)	
	2.6.4	Infrastructure as a Service (laaS) IT	41

	2.6.5	The Intelligence Community Cloud Infrastructure IT	
	2.6.6	The Intelligence Community Big Data IT	
	2.7 Belgi	ium Homeland Security & Public Safety IT Market – 2015-2022.	42
	2.7.1	Market Size & Dynamics - 2015-2022	
	2.7.2	Market Breakdown	44
3	Belgium Co	ommunication Systems & Devices Market 2015-2022	45
	3.1 Scop	De	45
		et and Technology Background	
	3.2.1	Emergency Communication	
	3.2.2	Belgium Counter Terror & Public Safety Communication	
		Equipment: Business Opportunities	48
	3.3 Belgi	ium Homeland Security & Public Safety Communication	
		ems & Devices Market- 2015-2022	49
	3.3.1	Market Size & Dynamics - 2015-2022	
	3.3.2	Market Breakdown	51
4	Relaium Ri	iometrics Market – 2015-2022	52
7		0e	
		inology and Market Background	
		modal Biometric Systems	
	4.3.1	Homeland Security & Perimeter Security Applications	
		ium Biometrics: Business Opportunities & Challenges	
		ium Biometrics Market – 2015-2022	
	4.5.1		
	4.5.2		
5	Bolgium Vi	deo Surveillance Technologies Market – 2015-2022	64
J	5.1 Scop	De	64
		o Surveillance: Market Background	
	5.2.1	Introduction	
	5.2.2		
	5.2.3	Belgium Video Surveillance Market: Business Opportunities &	
	0.2.0	Challenges	
	5.3 Video	o Analytics Market Background	73
	5.4 Belgi	ium Video Surveillance Technologies Market – 2015-2022	74
	5.4.1	Market Size & Dynamics - 2015-2022	
	5.4.2	Market Breakdown	
6	Rolaium In	trusion Detection Systems Market – 2015-2022	77
U		De	
		nology and Market Background	
	6.2.1	Access Control Systems	
	_	sion Detection Systems: Business Opportunities & Challenges	
	6.3.1	Challenges	
	6.3.2	Belgium Intrusion Detection Systems Market: Business	
	5. 5. 2	Opportunities	82
		11	

	6.4 Belgi	um Intrusion Detection Systems Market – 2015-2022	83
	6.4.1	Market Size & Dynamics - 2015-2022	83
	6.4.2	Market Breakdown	84
7		order & Perimeter Security Technologies Market – 2015-	
		e	
		er & Perimeter Barriers	
		ronic Fencing	
	7.3.1	Vibration Sensors Mounted on Fence	
	7.3.2	Capacitance Sensors Fence	
	7.3.3	Strain Sensitive Cables Fence	
	7.3.4	Fiber Optic Fence	
	7.3.5	Taut Wire Fence	
	7.3.6	Ported Coax Buried Line Fence	
	7.3.7	Fence	
	7.3.8	Electronic Fencing: Business Opportunities & Challenges	
		matic Border Control (ABC) Systems	
		um Border & Perimeter Security Technologies Market – 2015-	
	2022		
	7.5.1	Market Size & Dynamics - 2015-2022	93
	7.5.2	Market Breakdown	95
8	Belgium Ex	cplosives & Weapons Detection Technologies Market –	
			96
		e	96
		et Background	
	8.3 X-ray	/ Scanners	97
	8.3.1	Background	
	8.3.2	X-ray Screening Technologies	
	8.3.2.1	Luggage, Baggage & Other Items Screening Technologies	
	8.3.2.2	People Screening X-ray Backscatter (AIT) Technology	
	8.3.2.3	Coherent Scatter 2D X-ray	103
	8.3.2.4	Transportable X-RAY Screening Checkpoints	
	8.3.2.5	X-ray Technologies: Performance Comparison	
	8.3.3	X-ray Screening Market Background	
	8.3.3.1	Airports and Secured Facilities	
	8.3.3.2	Rail Stations X-ray Screening	
	8.3.3.3	Air Cargo Explosive Screening	
	8.3.3.4	ACES: The European Air Cargo Explosive Screening	
	8.3.3.5	The European RA3 and ACC3 Regulations	107
	8.3.4	Belgium X-ray Screening: Business Opportunities &	
		Challengesographic Explosive Detection Systems & BHS	108
		ographic Explosive Detection Systems & BHS	109
	8.4.1	Explosives Detection Systems: Technology Background	109
	8.4.2	Explosive Detection Systems: Throughput	109

8.	4.3	EDS Principle of Operation	110
8.	4.4	EU Standard - 3 Approved Tomographic EDS Products	
8.	4.5	Hybrid Tomographic EDS & 2D X-ray Screening	
8.	4.6	EDS EU Standard-3 Certification	
8.	4.7	Aviation Security: EDS Checked Luggage Screening	114
8.5	Secur	ity-related Airport Baggage Handling Systems (BHS)	115
8.6	Bagga	age Handling Systems	
	6.1	High-Volume In-Line Checked Luggage BHS Systems	116
8.	6.2	Checked Luggage BHS: Mini In-Line Checked Luggage	
		Screening System	
8.	6.3	Stand-alone EDS	
8.7		Market Background	
8.8	Explo	sives Trace Detection (ETD)	
_	8.1	Introduction	
	8.2	ETD Technologies	
	3.8.2.1	Technology Overview	
	3.8.2.2	Ion Mobility Spectroscopy (IMS)	
	3.8.2.3	Current Explosives & Narcotics Detection Technologies	
	3.8.2.4	Handheld and Desktop ETD	
	3.8.2.5	Airport Boarding Gate Explosives Scanners	
	3.8.2.6	Vehicle Screening ETD Systems	132
8.	8.3	EU Approved ETD Products: By Manufacturer, Model and	
_		Version	
	8.4	Belgium Business Opportunities & Challenges	
8.9		Detectors	
_	9.1	Hand-Held Metal Detectors	
	9.2	Walk Through Metal Detection Portals	136
8.10		ım Metal Detectors Market: Business Opportunities &	400
0 4 4		enges	
		off Explosives & Weapon Detection	
_	11.1	Technology and Market Background	
	11.2		145
8.12		Im Standoff Explosives & Weapon Detection: Business	
		rtunities & Challenges	
	3.12.1.1	1 1	
	3.12.1.2 Vahia	3 3	
		le & Container Screening Systems	
	13.1	Vehicle & Container Screening Portals Technologies	
	13.2	Comparison of Container-Vehicle Screening Technologies	
	13.3 13.4	X-ray Container-Vehicle Screening Systems Dual Energy X-ray Container-Vehicle Screening	
	13.4 13.5		
	13.5 13.6	Dual-View X-ray Container-Vehicle Screening	
		Backscatter X-ray Container-Vehicle Screening	
	13.7 13.8	Gamma Ray Systems Container-Vehicle Screening Linac Based X-ray Container-Vehicle Screening systems	
ο.	10.0	LINAU DASEU ATIAY CUINAINEITYENIUE SUIEENINU SYSIENIS	เบษ

	8.	13.9	Market Background	160
	8.14		um Explosives & Weapons Detection Technologies Market –	
			-2022	
		14.1	Market Size & Dynamics - 2015-2022	
	8.	14.2	Market Breakdown	163
9	Belg	ium Ot	her Security Technologies Market – 2015-2022	164
	9.1	Scope	e	164
	9.2	Belgiı	um C2/C4ISR Systems	165
	9.2	2.1	C2/C4ISR Market & Technology Background	165
	9.2	2.2	Belgium C2/C4ISR Systems: Business Opportunities	
	9.3 Belgiu		um Bio-Agents & Infectious Disease Mitigation	
	9.3	3.1	Market Background	171
	9.3	3.2	European Biosecurity	174
	9	.3.2.1	European Bio-Terror & Infectious Disease Detection and	
			Mitigation Standards	
	_	.3.2.2	Biosecurity and Biosafety	
		.3.2.3	European CBRN Defense Strategy	
		.3.2.4	European Commission Bio-Preparedness Actions	175
	9	.3.2.5	European Bio-Terror & Infectious Disease Detection and	
			Mitigation Legislation	
		.3.2.6	EU Biosafety and Biosecurity Initiatives	
		.3.2.7	Europe Infectious Diseases Threat Perception	
	9.3.2.8		European Bio-Surveillance Strategy	
	9.3.2.9		Bio-Terror & Infectious Disease Early Alert System	
	9.3.2.10		O Company of the comp	
	9.3.2.11		Early Response to Major Pandemics	
	9.3.3		Bio-Detection Technologies and Market Background	
		0.3.3.1	Sampling the Environment	
		0.3.3.2	Bio-Detectors in a Multitude of Ambient Settings	183
	9.	3.4	Bio-Agents & Infectious Disease Detection: Homeland	101
	9.4	Polaii	Security & Public Safety Applicationsum Bio-Agents & Infectious Disease Detection: Business	104
	9.4		rtunities	107
	9.5		um Chemical, Hazmat & Nuclear Detection	
		- Беідіі 5.1	Technology Background	
).5.1.1	Scope	
	9.5.2		Chemical Agent Detection Technologies	
	9.5.3		Nuclear/Radiological Detection Technologies	
	9.5.3.1		The Advanced Spectroscopic Portal (ASP)	
	9.5.3.2		Human Portable Radiation Detection Systems (HPRDS)	130
	3	.0.0.2	Program	190
	o	.5.3.3	Nuclear- Radiological People Screening Portals	
		5.4	Market Background	191
).5.4.1	Chemical Plant Security	
		0.5.4.2	Nuclear/Radiological Detection Markets	
	_	_		

9.5.5	Belgium Chemical, Hazmat & Nuclear Detection: Business	
	Opportunities	
9.6 Belgiu	m Decontamination of CBRN & Hazmat Incidents	196
9.6.1	CBRN & Hazmat Decontamination Technology Background	
9.6.1.1	Decontamination of CBRN & Hazmat Incidents	196
9.6.1.2	Decontamination Core Technologies	198
9.6.1.3	The Decontamination Cycle	
	Decontamination Strategy	
	CBRN & Hazmat Decontamination Market Background	
	The Decontamination Industry	
	m Natural & Manmade Disaster Mitigation	
	Market & Technology Background	
	Emergency Medical Services (EMS)	
9.7.3	Emergency Management Software	
9.7.4	Mass Emergency Notification Technologies	
9.7.4.1	Introduction	
9.7.4.2	Text Alert Systems	
9.7.4.3	Voice Alert Systems	
9.7.4.4	Siren Systems	208
9.7.4.5	Cell broadcast Mass Emergency Notification	
9.7.4.6	Mass Emergency Notification: Applications	210
9.7.4.7	Mass Emergency Notification: Business Opportunities	211
9.8 Belgiu	m Non-Lethal Weapons (NLW)	211
9.8.1	Less -Lethal Weapons Technology and Market Background	211
	Less-Lethal Weapons Market	
	Non-Lethal Weapons: Business Opportunities & Challenges.	
9.9 Belgiu	m Personal (Ballistic & CBRNE) Protective Gear	219
9.9.1	Market & Technology Background	219
	Personal Body Armor	
	Respiratory Protective Equipment	
	CBRN and Hazmat Personal Protective Gear	
	m Counter-IED Technologies	
9.10.1	Counter-IED Technology & Market Background	224
9.10.1.1	Maintenance and Upgrades (Particularly of Jammers, and	
	Armored Trucks)	
9.10.1.2	Sensors and Other Electronic Systems Upgrade/s	228
9.10.1.3	Standoff Suicide Bombers Detection	228
9.10.1.4	Suicide Bombers Detonation Neutralization	228
9.10.1.5	Standoff Detection of VBIED	
9.10.1.6	VBIED Detonation Neutralization	
9.10.1.7	Standoff Explosive Detection in Urban Environment	229
9.10.1.8	Large Area IED Detection Coverage	229
9.10.1.9	IED Placement Detection	230
9.10.2	Counter-IED Technologies: Business Opportunities &	
	Challenges	230

APP	ENDICES	.231
10	Appendix A: Belgium Counter Terror & Public Safety Agencies	.231
11	Appendix B: European Security Related Product Standards	.232
12	Appendix C: The European Union Challenges & Outlook. 12.1 Summary	.257 .260 .263 .263
	12.5 The EU Frail Leadership and Poor Strategic Vision	
	12.7 European Security Worries	.267 .267
13	Appendix D: Europe Migration Crisis & Border Security 13.1 Introduction 13.2 EU Migration: Background 13.3 The European Borders Security 13.3.1 Introduction 13.3.2 The Schengen Area 13.3.3 The European Integrated Border Management system (IBM). 13.3.4 The EU Smart Borders Initiative 13.3.5 The Schengen Zone: Passenger Name Record (PNR) System Outlook 13.3.6 Temporary Reintroduction of Border Control 13.4 European Smart & Secure Border Market	.270 .270 .280 .281 .283 .285 .286 .290
14	Appendix E: Abbreviations	.296
15	Scope, Methodology & Disclaimer 15.1 Research Scope	.308
16	Disclaimer & Copyright	.310

List of Tables

Table 1 - EU Cyber-Threats: Ranking & Trends – 2013-2015	22
· · · · · · · · · · · · · · · · · · ·	30
Table 3 - Belgium Cybersecurity Market [\$M] (incl. Sales, Aftersale and Other	
Revenues) and AGR [%] – 2015-2022	31
Table 4 - Belgium Homeland Security & Public Safety Information Technologies	
Market [\$M] (incl. Sales, Aftersale and Other Revenues) and AGR	
[%] – 2015-2022	42
Table 5 - Belgium Communication Systems & Devices Market: Business	
Opportunities	48
Table 6 - Belgium Homeland Security & Public Safety Communication Systems &	
Devices Market [\$M] (incl. Sales, Aftersale and Other Revenues)	
and AGR [%] – 2015-2022	49
Table 7 - Strengths and Weaknesses of Biometric Systems	55
Table 8 - Comparison of Biometric Modalities	
Table 9 - Belgium Biometrics Market: Business Opportunities	60
Table 10 - Belgium Homeland Security & Public Safety Biometrics Market [\$M]	
(incl. Sales, Aftersale and Other Revenues) and AGR [%] – 2015-	
2022	61
Table 11 - Video Surveillance Market: Business Opportunities	72
Table 12 - Belgium Video Surveillance Technologies Homeland Security & Public	
Safety Market [\$M] (incl. Sales, Aftersale and Other Revenues) and	
AGR [%] – 2015-2022	
Table 13 - Intrusion Detection Systems Market: Business Opportunities	82
Table 14 - Belgium Intrusion Detection Systems Homeland Security & Public	
Safety Market [\$M] (incl. Sales, Aftersale and Other Revenues) and	
AGR [%] – 2015-2022	83
Table 15 - Belgium Electronic Fencing Market: Business Opportunities	90
Table 16 - Belgium Border & Perimeter Security Technologies Market [\$M] (incl.	
, , , , , , , , , , , , , , , , , , , ,	93
Table 17 - Comparison of X-ray Detection Technologies	
Table 18 - Belgium X-ray Screening Market: Business Opportunities	.108
Table 19 - Explosive Detection Systems vs. Other Luggage Screening	
	.109
Table 20 - 64 EU Standard-3 Approved EDS Products: By Manufacturer, Model	
& Version	
Table 21 - EU Approved ETD Products: By Manufacturer, Model and Version	.133
Table 22 - Belgium Explosives Trace Detection (ETD) Market: Business	
Opportunities	
Table 23 - Belgium Metal Detectors Market: Business Opportunities	.139
Table 24 - Comparison of Open Space Explosives & Weapon Detection	
Technologies	
Table 25 - Container-Vehicle Screening - Technologies Comparison	.151

Table 26 - Belgium Explosives & Weapons Detection Technologies Market [\$M] (incl. Sales, Aftersale and Other Revenues) and AGR [%] – 2015-	
2022	.161
Table 27 - Belgium Counter Terror & Public Safety C2/C4ISR Business	
Opportunities	.170
Table 28 - Belgium Bio-Agents & Infectious Disease Detection Market: Business	
Opportunities	.188
Table 29 - Nuclear Terror Detection Roadmap	.189
Table 30 - Typical Goals of an EMS System: Daily vs. Disaster	.205
Table 31 - Notification Systems Technologies Characteristics	.208
Table 32 - Belgium Mass Emergency Notification Market: Business Opportunities .	.211
Table 33 - Non-Lethal Weapons Counter-Personnel Means	.213
Table 34 - Electromagnetic NLW Technologies	.215
Table 35 - Mechanical & Kinetic, Acoustic, Ancillary and Chemical NLW	
Technologies	.215
Table 36 - Non-Lethal Weapons Market: Business Opportunities	.218
Table 37 - European Homeland Security and Public Safety Standards	.232
Table 38 - Membership in the EU, Eurozone, and Schengen Area	.259

List of Figures

Figure 1 - The EU ENISA, Cybersecurity Flowchart	20
Figure 2 - EU ENISA Threat Taxonomy and its Use-cases	21
Figure 3 - The European "Computer Emergency Response Teams & Command	
Centre" (CERTs. CERT/CCs)	28
Figure 4 - Belgium Cybersecurity Market [\$M] by Revenue Category (Sales,	
Aftersale and Other Revenues) – 2015-2022	32
Figure 5 - Belgium Cybersecurity Market Share [%] by Revenue Category –	
2015-2022	33
Figure 6 - Belgium Homeland Security & Public Safety Information Technologies	
Market [\$M] by Revenue Category (Sales, Aftersale and Other	
Revenues) – 2015-2022	43
Figure 7 - Belgium Homeland Security & Public Safety Information Technologies	
Market Share [%] by Revenue Category – 2015-2022	44
Figure 8 - Belgium Homeland Security & Public Safety Communication Systems	
& Devices Market [\$M] by Revenue Category (Sales, Aftersale and	
Other Revenues) – 2015-2022	50
Figure 9 - Belgium Homeland Security & Public Safety Communication Systems	
& Devices MarketShare [%] by Revenue Category – 2015-2022	51
Figure 10 - Brussels Airport Biometric Automated Border Control	53
Figure 11 - Elements and Flowchart of a Biometric System	54
Figure 12 - Belgium Homeland Security & Public Safety Biometrics Market [\$M]	
by Revenue Category (Sales, Aftersale and Other Revenues) –	
2015-2022	62
Figure 13 - Belgium Homeland Security & Public Safety Biometrics Market Share	
[%] by Revenue Category – 2015-2022	63
S S	65
Figure 15 - A Wireless Video Surveillance System	69
Figure 16 - Belgium Video Surveillance Technologies Homeland Security &	
Public Safety Market [\$M] by Revenue Category (Sales, Aftersale	
and Other Revenues) – 2015-2022	75
Figure 17 - Belgium Video Surveillance Technologies Homeland Security &	
Public Safety Market Share [%] by Revenue Category – 2015-2022	
Figure 18 - Multi-Modal Intrusion Detectors	
Figure 19 - Example of Intrusion Detection System Architecture	80
Figure 20 - Belgium Intrusion Detection Systems Homeland Security & Public	
Safety Market [\$M] by Revenue Category (Sales, Aftersale and	
Other Revenues) – 2015-2022	83
Figure 21 - Belgium Intrusion Detection Systems Homeland Security & Public	
Safety Market Share [%] by Revenue Category – 2015-2022	
Figure 22 - Diagram of Physical Security Fence Functions	
Figure 23 - Automated Border Controls Technology	
Figure 24 - Automated Passport Control at Brussels Airport	92

Figure 25 ·	- Belgium Border & Perimeter Security Technologies Market [\$M] by	
	Revenue Category (Sales, Aftersale and Other Revenues) – 2015-	
	2022	94
Figure 26	- Belgium Border & Perimeter Security Technologies Market Share [%]	
J	by Revenue Category – 2015-2022	95
Figure 27	- Major Explosives Detection Technologies: Bulk vs. Trace	
-	- X-ray Conveyor-Based Screening Systems – Principles of Operation	
•	- Multi-View Dual Energy X-ray Screening	
	- X-ray Backscatter (AIT) Principle of Operation	
	- Backscatter People Screening Portal	
	- Coherent X-ray Scheme	
	- Rapiscan Mobile Check ES002 Contains Two Screening Lanes	
	- Whole-Object EDS Scheme	
	- EDS Based Luggage Screening System at Heathrow Airport	
	- Aviation Security: "100% EDS" Screening Flow Scheme	
	- Checked Luggage ETD, EDS & X-ray Screening	
•	- Checked Luggage ETD, EDS & X-ray Screening	
	- Schematic Visualization of a Mini In-Line System	
	- Checked Luggage ETD, EDS & X-ray Screening Mini In-Line System	
J	with Light Integration	119
Figure 41	- Checked Luggage ETD, EDS & X-ray Screening Configuration 4 -	
J	Stand-alone EDS	120
Figure 42	- Explosive Trace Detection: Principle of Operation	124
	- ETD Operational Workflow	
	- Explosive Materials Classification	
	- The Most Commonly Used Explosives Classification	
-	- Explosives Detection Technologies: Bulk vs. Trace Detection	
•	- Explosives Trace Detection Configuration: Hand Held ETD, &	
J	Tabletop ETD	129
Figure 48	- Boarding Card ETD Reader	131
	- Airport Boarding Gate with Built-in ETD Screening Technology	
	- Hand-Held Weapon Metal Detector "Wands"	
	·	137
Figure 52	- A Walk through Mobile Metal Detector	138
	- Suicide Attack Sequence	
	- Spectrum of Evolving Standoff People Screening Technologies	
	- PBIED & VBIED Detection Technologies: Performance Criteria	
	- Container/Vehicle Screening Technologies	
	- X-ray Screening – Block Diagram	
	- Dual Energy X-ray	
	- Dual View X-ray – Principles of Operation	
	- Backscatter X-ray + Penetrating X-ray	
	- Gamma Ray Screening - Block Diagram	
	- Linac Screening System Block Diagram	

Figure 63 - Belgium Explosives & Weapons Detection Technologies Market [\$M]	
by Revenue Category (Sales, Aftersale and Other Revenues) –	
2015-2022	162
Figure 64 - Belgium Explosives & Weapons Detection Technologies Market	
Share [%] by Revenue Category – 2015-2022	163
Figure 65 - A Seaport Security C2/C4ISR System Block diagram	170
Figure 66 - Biosecurity and Safety Agencies & Processes Roadmap	173
Figure 67 - Airborne Bacterial Concentration Fluctuation in a Single Day	183
Figure 68 - The European Bio-Detection Surveillance and Situational Awareness	;:
Areas of Responsibility	187
Figure 69 - Multi-Tiered Chemical, Hazmat & Nuclear Detection and Mitigation	191
Figure 70 - Nuclear-Radiological Threats Weapon Sophistication vs.	
Consequence	192
Figure 71 - The Three-tiered Port of Entry Nuclear Threat Screening Architecture	194
Figure 72 - Comparison in Weight of Pathogens between BW Agents and CW	
Agents [mg]	196
Figure 73 - Closed Area (e.g., building) Decontamination Boundaries	197
Figure 74 - Open Area Decontamination Boundaries	197
Figure 75 - Decontamination Corridor	
Figure 76 - Decontamination Core Technologies Overview	198
Figure 77 - The Decontamination Cycle	199
Figure 78 - Decontamination Strategy: from Sample Collection to	
Decontamination Clearance	200
Figure 79 - Basic Phases of Response and Recovery to a CBRN & HAZMAT	
Incident	201
Figure 80 - The Bio Attack Response Timeline	
Figure 81 - Multimodal Mass Emergency Notification	
Figure 82 - Near Term Counter-Personnel NLW	
Figure 83 - Less-Lethal Weapons Clinical Effects	
Figure 84 - Mid-Term Counter-Personnel Non-Lethal Weapons	213
Figure 85 - Far-Term Counter-Personnel Non-Lethal Weapons	214
Figure 86 - Personal Body Armor	220
Figure 87 - Respiratory Protective Equipment Segments	221
Figure 88 - CBRN Personal Protective Gear	222
Figure 89 - IED Ready for Detonation	
Figure 90 - IED "Kill Chain" and Its Relevant Time Frame	
Figure 91 - Belgium Counter Terror & Public Safety Agencies Organogram	231
Figure 92 - The European Union: Member States and Candidate Countries	
Figure 93 - EU Countries Currency Status- 2016	
Figure 94 - European 2015-2016 GDP Growth Forecast [%] By Country	
Figure 95 - Europe GDP per capita By Country	262
Figure 96 - 2015 Refugee Applications to Europe by Month	271
Figure 97 - 2015 Migrant Applications to Europe by Country of Origin	272
Figure 98 - Main Routes of Migration	
Figure 99 - Furopean Asylum-Seeker Decisions by Country	274

Figure 100 -Refugee Acceptance by Country 2015	276
Figure 101 - Asylum Claims per 100.000 Local Populations 2015	
Figure 102 - Fragility and Instability in Europe Neighborhood MEA Countries	279
Figure 103 - Europe Inflows of Threats	280
Figure 104 - European Borders	281
Figure 105 - The 2016 Schengen Border Map	282
Figure 106 - The Advanced Passenger Analysis (APA) System	290
Figure 107 - Migrant Arrivals by Sea and Land Borders in 2015	292