Towards Outreach 2.0: Emerging Technologies and Effective Outreach Practices

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1. Emerging Technologies and Non-State Actor WMD Threats

Since the passage of United Nations Security Council resolution (UNSCR) 1540 in 2004, the Security Council and the Committee established pursuant to the resolution have adapted and evolved to changing conditions affecting Member States' implementation of their UNSCR 1540 obligations. The 1540 Committee has focused on many such challenges, but one of the most pressing has been in relation to technological advances. In its 2016 Comprehensive Review Report, the 1540 Committee "took note of the increasing risks of proliferation in relation to non-State actors arising from developments in terrorism and in relation to the potential for misuse arising from the rapid advances in science, technology and international commerce and the need for States to pay constant attention to these developments to ensure effective implementation of the resolution."[1] In UNSCR 2326 (2016), adopted by the Security Council following the Comprehensive Review, the language went even further, and in paragraph 7 called upon Member States to "take into account developments on the evolving nature of risk of proliferation and rapid advances in science and technology in their implementation of resolution 1540 (2004)."[2]

The rising attention of the international community to the non-State actor threats posed by technological advances has permeated discussions not just in the UN Security Council, but also among individual United Nations Member States and other regional and multilateral bodies. In the United States, the discussion has centered mainly around the possibility of adding particular emerging technologies to control lists, with those technologies being specifically identified in the Advanced Notice of Proposed Rulemaking (ANPRM) published by the Department of Commerce in 2018.[3] In other regions and countries, the debate over managing advancing technologies has begun in the context of investment controls but is progressing to the realm of export controls. The European Union (EU), in May 2019, adopted Regulation 2019/452 establishing a framework for the screening of foreign direct investments (FDI) and subsequent guidance on implementation of the regulation in March 2020.[4] In November 2019, the Japanese Diet passed an amendment to their Foreign Exchange and Foreign Trade Act (FEFTA) introducing new, more

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1 "United Nations Security Council Resolution 1540 Comprehensive Review," Security Council Committee Established Pursuant to Resolution 1540, 2016, <https://www.un.org/en/sc/1540/comprehensive-and-annual-reviews/2016-comprehensive-review.shtml>.

2 Security Council Resolution 2325, S/RES/2325 (15 December 2016), available from <https://undocs.org/S RES/2326(2016)>.

3 "Review of Controls for Certain Emerging Technologies," Advanced Notice of Proposed Rulemaking, United States Department of Commerce, Bureau of Industry and Security, 2018, <https://www.federalregister.gov/documents/2018/11/19/2018-25221/review-of-controls-for-certain-emerging-technologies>.

4 "Regulation (EU) 2019/452 of the European Parliament and of the Council of 19 March 2019 Establishing a Framework for the Screening of Foreign Direct Investments into the Union," <https://eur-lex.europa.eu/eli/reg/2019/452/oj>.

stringent controls on foreign investment.[5] While most countries already have some form of controls on FDI, many have chosen to tighten these laws over the last several years. For years, the EU, individual EU Member States, and other countries have also been analyzing groups of technologies to determine whether there is a basis for control in the multilateral export control regimes or on a state-level basis.[6]

That the 1540 Committee highlighted the threat of advancing technologies in its 2016 Comprehensive Review signals that the threat of non-State actor misuse of advancing technologies is a growing threat and that, in the context of complying with the resolution, Member States must give attention to this specific threat in their implementation of their UNSCR 1540 obligations. The nature of such attention – and the subsequent measures it implies – is complicated by the lack, so far, of concrete technical specifications on most particular technologies, especially as it regards their potential end-use by non-State actors.

"[Advances in technology]" as expressed by the Committee is not precisely defined, possibly due to the fact that the possible applicability of an emerging industrial process to WMD manufacture, development, acquisition, transport, and transfer is not yet fully understood, and that the possibility that goods and technology used in emerging technologies are too widely available to regulate.

While technologies advance at a rapid pace, however, and listing them in national control lists may still be premature, governments have an obligation to follow and take action to manage and preclude potential security threats. At this point, national governments, on their own and collectively through export control regimes, cannot as of yet regulate these sectors through the use of national control lists and other traditional means. Therefore, alternatives must be found to control list-driven outreach efforts in the emerging technology realm. An ongoing process of discovery between government and exporters is key to understanding how emerging technologies might enable a non-State actor to acquire, develop, or transfer WMD or its means of delivery and what best practices can be established to mitigate this risk.

The objective of this report is to empower governments with tools, in the form of good practices, with which to conduct outreach to emerging technology sectors that could

5 Sakon Kuramoto, Benjamin Miller, Hiroki Sugita, "Amendment to Japanese Foreign Exchange and Foreign Trade Act Regulations Expands Scope of "Restricted Businesses" to Include Some Information and Communications Technology Businesses," JD Supra, June 22, 2019, <https://www.jdsupra.com/legalnews/amendment-to-japanese-foreign exchange-68547/>.

6 For a full list of FDI legislation worldwide, see the Investment Policy Hub's website: <https://investmentpolicy.unctad.org/investment-laws>.

be targeted by non-State actors for malicious purposes. These sectors include not just private industry but also academia, research, and non-traditional exporter communities such as Do it Yourself (DIY) and maker communities.[7] The report authors have identified an advanced outreach model – Outreach 2.0 - that states could adopt to be able to meet evolving threats, including that of non-State actor exploitation of advancing technologies. The Outreach 2.0 model advances a more customized, targeted, creative, real-time, and collaborative communication strategy between regulators and exporters that builds trust, support, knowledge-sharing, and inclusion. The Outreach 2.0 model presented in this report draws upon an analysis of existing best practices, risk assessments, surveys, interviews, and stakeholder feedback.

The report is structured towards the introduction of this model through an in-depth analysis of current outreach practices. The authors first discuss the importance of outreach and the benefits it brings to both regulators and the private sector. The report also identifies the targets of outreach in the context of advancing technologies as well as the universe of tools available to government authorities to communicate with exporters. The report then highlights case studies of effective practices as well as analyzes the results of a survey conducted by the authors regarding governments' approach to outreach in emerging technology sectors. The report then make the case for an evolved, nuanced, targeted, flexible, and inclusive model of outreach designed to meet the challenges posed by emerging technologies, Outreach 2.0. The report concludes with recommendations for how to promote and integrate this model in ongoing programs and further avenues for strengthening UNSCR 1540 outreach efforts.

2. Next Generation Outreach

As strategic trade controls have evolved through the decades, strategies to identify and communicate with exporters have evolved as well. Public-private communication, coordination, and partnership is essential to successful implementation of UNSCR 1540, and beyond that, to international peace and security broadly speaking. Exporters of WMD-related goods, materials, and technologies stand at the forefront of research and development, but also serve as the first point of contact for the distribution and flow of R&D to customers, partners, and the public sector. Due to the threat of non-State actors acquiring WMD-sensitive technology for malicious purposes through FDI,

7 For an example of the role and significance of DIY communities to emerging technology sectors, see Robert Shaw, Ferenc Dalnoki-Veress, Shea Cotton, Joshua Pollack, Masako Toki, Ruby Russell, Olivia Vassalotti, and Syed Gohar Altaf, "WMD Proliferation Risks at the Nexus of 3D Printing and DIY Communities," Occasional Paper No. 33, James Martin Center for Nonproliferation Studies, October 27, 2017, <https://www.nonproliferation.org/wp-content/uploads/2017/10/op33-wmd-proliferation-risks-at-the-nexus-of-3d-printing-and-diy-communities.pdf>.

technology holders that may not yet export also should be made aware of potential risks and responsibilities vis-á-vis nonproliferation.

As successive UNSCR 1540 Committee Chairs and periodic reviews of UNSCR 1540 have called upon UN Member States to implement effective industry outreach programs, many countries have recognized that the utility of outreach goes beyond simply complying with the resolution. Exporter awareness, engagement, and buy-in is key to effective trade policy, national security, and even technological progress.

For years, competent authorities managing trade controls, especially in countries with advanced controls, have launched outreach efforts and underscored the importance of compliance to their exporters, with a varying degree of success. In recent years, outreach focus has broadened from strictly industry-based efforts to also include academic and research institutions due to increased awareness of the intangible ways that sensitive, controlled transfers can take place – through publications, online communications, travel, conversations, or other intangible means. The intersection between intangible transfers and advancing technologies poses a particularly stark challenge for traditional list-based export controls and necessitates creative thinking regarding how to target and conduct outreach.

Effective methods used to increase awareness within private sector and research communities on risks of advancing technologies cannot focus solely on what the law is and possible punishments – especially with regards to non-listed goods and technologies where laws may not exist. Effective outreach instead must focus on the ultimate objective – security, competitiveness, or both – to instill a culture of awareness. For dual-use goods, for example, reinforcing to exporters that their seemingly innocuous exports could be used by bad actors in a nuclear, chemical, biological, or missile program introduces an ethical/moral obligation that goes beyond threatening punishment for breaking an administrative obligation. By the same token, awareness can be raised by identifying incentives for compliance, such as competitive advantage and protection of intellectual property. Overall, linking compliance and nonproliferation efforts to good corporate social responsibility can provide a powerful incentive to exporters to integrate effective compliance and awareness into their organizational culture.

In the context of emerging technologies whose WMD end-use is not always known and therefore under a clear-cut list-based license obligation, the role of outreach in focusing on potential malicious use is important as a first line of defense against non-State actors seeking to exploit technology for WMD purposes. Communication and relationship-building between regulators and the private sector is critical at early stages of technology development. Without concrete regulations managing transfers of advancing technologies, the onus to act responsibly falls directly on exporters. Efforts by regulators to increase self-policing through reinforcement of ethical and legal standards as well

as other incentives can increase compliance and minimize the possibility of non-State actors acquiring sensitive technologies for malicious end-uses. Both sides can benefit, as described below:

Benefits to Regulators

- Inform government authorities of the latest technological developments and state-of-play;

- Provide information regarding the composition of those in the field. As outreach efforts are grounded in a mapping of the national technological base in order to determine to whom to conduct outreach, the outcome will be an accurate and constantly updated view of advancing technology sectors, which can also show trends and development. This information is useful not just for security, but technological competitiveness vis-à-vis other countries;

- Develop trust and open lines of communication between regulators and the private sector. Similarly, as for controlled and listed items, a strong relationship between regulators and the private sector means that exporters have more incentive to be compliant as well as ask questions and report suspicious behavior without fear of getting punished or receiving increased attention;

- Develop a more nuanced and realistic understanding of the effect of potential controls over specific technology areas, and how they may affect industry/research R&D and output;

- Better prepare regulators to handle license applications in the case that controls over specific technologies are eventually introduced;

- Strengthen norm-setting regarding uses and strengthen ethical standards; and

- Comply with international legal obligations, including with UNSCR 1540.

Benefits to Technology Holders – Current and Potential Exporters

- Become better informed and aware of the potential security-related applications of their technologies;

- Contribute to the design and implementation of any regulations through channels of communication with regulators;

- Become better prepared to comply with any eventual export control authorizations necessary or can spot situations where catch-all controls may apply;

- Participate in networking opportunities for technology holders, build a network of exporters and regulators, and learn about how other organizations are handing emerging technology challenges; and

- Increase in competitive advantage due to protection of sensitive R&D from competitors.

- Increase corporate social responsibility and gain reputational advantage.

3. Outreach Targets

The burgeoning awareness of the potentially revolutionary impact of emerging technologies has likewise necessitated an expansion of outreach targets.[8] The traditional targets of export control outreach are exporting producers and conveyers of dual-use or defense-related items.[9] The arising strategic concerns over the innovation sector necessitates the inclusion of universities, research institutes, and emerging technology companies.[10] In addition, to address the associated risks of emerging technologies, outreach will also need to target more than trade-related commercial activities, such as investment.

Initial examples of emerging technologies have included distributed ledger technology (i.e., blockchain), artificial intelligence and machine learning (AI/ML), quantum computing, synthetic biology, additive manufacturing, autonomous systems, and

8 In a Center for a New American Security report, Ben FitzGerald and Shawn Brimley defined "revolutionary" technology in the defense sector as "a technology or a set of technologies applied to a relevant problem in a manner that radically alters the symmetry of military power between competitors" which then "immediately outdates the policies, doctrines and organization of all actors." Ben FitzGerald and Shawn Brimley, Game Changers: Disruptive Technology and U.S. Defense Strategy, CNAS Publication, September 2013, p. 11. See also, Jennifer J. Snow, "Entering the Matrix: The Challenge of Regulating Radical Leveling Technologies," Monterey: Naval Post Graduate School, 2015, p. 5.

9 As noted in a recent report on AI and export controls: "Exporter awareness and buy-in is key to effective trade policy. For years, competent authorities managing trade controls, especially in countries with advanced controls, have launched outreach efforts to educate and underscore the importance of compliance to their exporters, with a varying degree of success. In recent years, outreach focus has broadened from strictly industry-based efforts to also include academic and research institutions due to increased awareness of the intangible ways that sensitive, controlled transfers can take place – through publications, online communications, travel, conversations, or other intangible means." See Viski et. al, "Technical Report: Artificial Intelligence and Strategic Trade Controls," Strategic Trade Research Institute and Center for International and Security Studies at Maryland, June 2020.

10 The focus on "innovation" and emerging technologies animates the Pentagon's current, third, Offset Strategy, as a means to "assure U.S. military superiority." On innovation and the evolving national security calculus, see, for example, James Manyika and William H. McRaven, and Adam Segal, "Innovation and National Security Keeping Our Edge," Independent Task Force Report No. 77, 2019, Council on Foreign Relations.

nanotechnology.[11] However, as countries differ based on their technology landscape and development objectives, the specific kinds of advancing technologies and their associated nascent sectors should be identified on a case-by-case basis, in relation to non-State actor WMD threats. Strategies for private sector identification and risk assessment should also be in line with the technology and threat landscape of individual countries.

Once this process is developed, associated R&D and production ecosystems will often represent targets new to export control and national security. For example, the early association of artificial intelligence as an emerging technology quickly exposed the limitations of traditional outreach. Artificial intelligence (AI) is a hallmark emerging technology and represents the need for multilevel outreach. As a composite technology phenomenon, AI is composed of hard and software dimensions and globe-spanning research and development and investment networks. Traditional export control outreach (i.e., government risk management guidance to exporters) is insufficient to find and address the relevant audiences. Outreach to AI sectors will need to target venture capital, universities, and technology companies to ensure compliance. Furthermore, compliance in each case will necessarily vary depending on the organization and outreach calibrated accordingly. Foreign investors, working with domestic venture capital, will need to understand the risks and limits of investing in certain AI fields.

The initial outreach targets can also serve as resources for government compliance agencies by providing the government insights and access to the relevant emerging technology field. Emerging technology outreach targets will also be essential partners in further defining the universe of and limits to controlling emerging technologies and associated risks. Many of the emerging technologies thus far are precisely that: technology. They are intangible in nature and, as such, difficult to control. Outreach targets can provide policy reality checks and suggest viable means to managing their flow. In summary, the benefits of governments understanding their emerging technology sectors include:

- Increased capacity to define emerging technologies and prioritize associated security threats;

- As emerging technologies are identified, a clear understanding on the national technology sector allows authorities to more effectively protect intellectual property and develop strategies to prevent illicit acquisition through foreign direct investment;

- Improved efficiencies in government outreach by targeting key sectors; and

11 For example, see Congressional Research Service, "Defense Primer: Emerging Technologies," December 19, 2019 and Christopher A. Bidwell and Bruce W. MacDonald, "Emerging Disruptive Technologies and their Potential Threat to Strategic Stability and National Security," Federation of American Scientists, September 2018.

- Through identification of relevant technology sectors, the technology stakeholder can become aware of and comply with developing national controls.

4. Exporter Outreach Tools

Many states have evolved markedly in their approach to private sector outreach since their initial implementation of programs. Aided by their own experience and learning from other states, competent authorities have learned what works and what does not, how to effectively target, and innovative ways to not only reach, but impact compliance behavior. These practices can be drawn upon for outreach to emerging technology sectors, even where existing export controls do not exist. This section will summarize many of the tools available to competent authorities and how they may or may not be applied in emerging technology sectors.

The authors have divided outreach tools into two broad categories: written and human. The written category involves all of the communication that can be accessed or shared with a target audience that does not usually require active interaction. The human category involves all outreach that relies on communication, in person or through other channels. Elements from both categories can be essential to an effective outreach strategy.

Written:

Website:

Effective outreach though websites implies more than having a page with a copy and paste of national and/or international regulations. Having a clear, informative, interactive, user-friendly website that can be easily found on web searches is now the minimum accepted best practice. The website should also contain contact information for the private sector to be able to reach out to relevant government personnel in case of an issue or question;

Newsletter:

While countries may choose the frequency of newsletters, regular mailings to target audiences with information about threat trends, red flags, changes/updates to regulations, helpful information, and case studies helps the private sector stay aware and informed of their obligations;

Pamphlet:

Pamphlets can be mailed electronically, physically, or handed out at meetings and conferences. They provide a tangible, easy, low-cost way to interact with the private sector and while brief and easy to read, should include references to websites and other materials that provide more information. In this sense, they

are a gateway to deeper engagement.

Survey:

Regulators may send surveys out to exporters in order to gather information and feedback on specific issues. Surveys can be send to predetermined mailing lists and customized according to recipient profile. The survey may also contain information for the exporter.

Guide/Manual: While denser in substance, guides and manuals can provide specialized private sector personnel handy reference to relevant standards, regulations, and enforcement procedures, as well as details on specific procedures such as license applications, registrations, and more. Importantly, published guides and manuals must be regularly updated in order to ensure timeliness. Examples include internal compliance manuals and best practice guidelines.

Annual report:

Annual reports on trade data, trends, patterns, updates, outreach activities, and more, strengthen transparency and are an invaluable tool to the private sector as well as to other government agencies. Many countries also publish annual reports to draw attention to the private sector of their enforcement activities and penalties, for both deterrence and transparency.

Example Box 1

The German Export Control Manual (HADDEX)

The German Federal Office for Economic Affairs and Export Controls (BAFA) publishes a manual on export controls that can be used by its private sector.[12] The manual provides explanations and materials that cover a wide range of subjects and is appropriate as an entry guide, a training resource, and is helpful to implementing internal compliance practices. The guide covers a broad range of subjects, for example, sanctions, relevant legal provisions of export control law, forms and samples, circulars and other publications. The guide is kept up to date to ensure that the private sector can keep up with the latest information and guidelines.

12 German Federal Office for Economic Affairs and Export Controls, <https://www.bafa.de/DE/Aussenwirtschaft/Ausfuhrkontrolle/Arbeitshilfen/arbeitshilfennode.html>.

Human:

Outreach event:

In addition to written information disseminated in a variety of ways as listed above, investment in proactive, face-to-face engagement by government authorities with the private sector can enhance awareness and build relationships and trust that can often be long-lasting and effective. The lasting impact of outreach events depends on accurate targeting of organizations, including those identified to be the greatest risk of security threat based on risk analysis. These events should be structured to provide participants important information on regulations but also on trends, good practices, and incentives. An open line of communication should always be presented whereby the private sector can remain in contact post-event.

Conference:

Conferences provide opportunities for equal engagement from the private and public sector, as both can present and participate in discussion during Q&A. In addition, conferences organized by the public sector can provide advertisement or publicity opportunities for the private sector, an additional incentive to participate and learn.

Telephone:

Making calls to target sector organizations as well as leaving a telephone line of communication open can help establish regular, information communication and build trust between the government authorities and the private sector.

Webinar:

Webinars can be relatively low-resource, high-impact tool for reaching out to the private sector. They can cover a variety of topics or take on different formats: providing updates, information on trends, or focus on one specific issue. In addition, through webinars, a larger audience can be reached from different geographical areas.

Advisory Committees:

Advisory committees devoted to specific issues and composed of diverse experts and leaders from the private sector that engage with the public sector (often at the inter-agency level) on a regular basis strengthen trust and communication and create opportunities for direct engagement and impact. It is key to engage a variety of different actors relevant to each committee issue – large, medium, small, research, for-profit, etc. In the emerging technology arena, this can be an especially useful tool. The private sector can provide government authorities

with valuable information – direction of technology advancement, composition of the market in specific areas, competitors abroad, investors, as well as the potential effects and impacts that new regulations, rules, or policies would have. TACs should include diverse voices from advancing technology communities – not just leading multinational companies, but also small and medium-sized enterprises, university research departments, and even, potentially, members of the maker community. These forums can be replicated in other contexts as well and create a bridge between the private and public sector when formulating policy and forecasting future policy needs challenges.

Collaborative Activities:

Regulators can engage exporters in collaborative activities that aid in awareness-raising and compliance, such as websites, workshops, or other outputs. Such activities may also take place to support the formulation of regulations.

Example Box 2:

United States Technical Advisory Committees (TACs)

In the U.S., TACs advise the Department of Commerce on the technical parameters for export controls applicable to dual-use commodities and technology and on the administration of those controls. In 2018, the Department of Commerce established a TAC on Emerging Technologies (ETTAC) composed of academia, industry, National Laboratories, and United States government departments and agencies.[13]

The TAC serves to identify emerging technologies and research and development activities that may be of interest from a dual-use perspective. It also works to prioritize new and existing controls to determine which are of greatest consequence to security, the potential impact of dual-use export control requirements on research activities, and the threat to national security posed by the unauthorized export of technologies.[14]

In addition to the emerging technology TAC, the U.S. convenes TACs for areas such as information systems, materials processing equipment, and sensors and instrumentation.

13 A list of ETTAC members can be reviewed at <https://www.aip.org/sites/default/files/aipcorp/images/fyi/pdf/ettac-members-at-may-meeting-2020.pdf>.

14 "Technical Advisory Committees," U.S. Department of Commerce, Bureau of Industry and Security, <https://bis.doc.gov/index.php/28-technology-evaluation/146-technical-advisory-committees-tac>.

In addition to these face-to-face options for engaging the private sector, other tools exist, such as funding projects implemented by academia/research, or regular private meetings with private sector leaders.

Example Box 3:

European Union's Dual-Use Regulation Reform

In 2011, the European Union (EU) initiated a reform of its dual-use legislation, Regulation 428/2009 (2004), which kicked off a more than decade-long process of discussion and feedback with the private sector. A significant part of the reform process focused on emerging technologies with potential impacts on human rights, in addition to security. Given the novel angle of parts of the proposed reforms, the private sector's feedback was solicited a number of times from the initiation of the reform process to the present, when negotiations on a reformed regulation are still in the process of being amended and agreed to in the European institutions. For example, in 2011, a "Green Paper" was published which asked the private sector to comment on specific areas of the Regulation. The European Commission, which is the executive branch of the EU, took further actions in the form of establishing a broader view and outlining reform options, leading to a formal proposal, based in part on the responses received.

In addition, the reform process spurred the Commission to hold outreach events, or "Export Control Forums," on a yearly basis. The forums invite representatives from EU Member States and the European Parliament, industry, and civil society to participate and provides them an opportunity to review ongoing export control implementation and latest developments.

Example Box 4:

United States' Advanced Notice of Proposed Rule Making

On November 19, 2018, the U.S. Bureau of Industry and Security (BIS) published an Advanced Notice on Proposed Rulemaking (ANPRM) seeking public comment on criteria for identifying emerging technologies. The ANPRM included fourteen representative categories of technologies from which BIS seeks to determine whether export controls should be placed on them or their subsets:

- Biotechnology
- Artificial intelligence and machine learning
- Position, navigation, and timing technology
- Microprocessor technology
- Advanced computing technology
- Data analytics technology
- Quantum information and sensing technology
- Logistics technology
- Additive manufacturing
- Robotics
- Brain-computer interfaces
- Hypersonics
- Advanced materials
- Advanced surveillance technologies

The ANPRM also notes that the definitional process will be ongoing through the interagency process, private sector outreach, the Emerging Technology Technical Advisory Committee, and the Committee on Foreign Investment in the United States (CFIUS). After the review period, BIS will decide whether to issue corresponding list entries and controls on the export, re-export, or transfer of those technologies. The ANPRM is an example of how directly the private sector can be involved in the policymaking process, especially in terms of shaping the discourse and considered impacts. At the end of the period during which responses were accepted, hundreds of comments were received from industry, research, academia, and even private individuals.

5. Case Studies of Current and Ongoing Effective Practices and Lessons Learned

Operative paragraph 8(d) of UNSCR 1540 "[C]alls upon all States to develop appropriate ways to work with and inform industry and the public."[15] Many examples of this public-private partnership demonstrate good practice, and several are highlighted in this section as particularly effective.

The Weisbaden Process

The Federal Government of Germany, in cooperation with the United Nations Office for Disarmament (UNODA), created the "Wiesbaden Process" in 2013, a series of conferences designed to promote private sector awareness of the goals of UNSCR 1540.[16] The conferences provide a venue for open dialogue between the private sector and governments without any obligations. Government authorities and those subject to controls share their experiences with each other and as well as with countries that may have nascent export control, and private sector outreach, programs. The results of each conference are subsequently made available to all UN Member States.

Wiesbaden builds upon a tradition of outreach at the national level in several countries and provides a channel by which regulators can have a regular exchange with industry on the interpretation and implementation of import requirements and export laws and regulations. Wiesbaden engagements have also focused on developing new approaches to outreach (e.g., e-learning) and identifying additional targets and proliferation threats. For example, at the Indian government-sponsored 2018 Wiesbaden event, participants stressed "the importance of improved communication between industries and government on evolving proliferation risks."[17]

Japan's Targeted Approach

As a major innovation-driven economy, Japan has long relied on robust university and research institute R&D to drive and sustain economic growth. Over the past decade,

15 "United Nations Security Council Resolution 1540 Comprehensive Review," Security Council Committee Established Pursuant to Resolution 1540, 2016, <https://www.un.org/en/sc/1540/comprehensive-and-annual-reviews/2016-comprehensive-review.shtml>.

16 See "Risks, challenges and responses: Industry's effective practices in responding to biosecurity risks: A Conference in Support of Implementing Security Council resolution 1540 (2004)," United Nations Security Council, S/2014/76, December 3-4, 2013, <https://undocs.org/S/2014/76>.

17 India-Wiesbaden Conference 2018, "Securing Global Supply Chains through Government-Industry Partnerships towards Effective Implementation of UNSCR 1540," April 16-17, 2018, India-Germany Joint Outcome Document <https://www.un.org/en/sc/1540/documents/India-Wiesbaden-Conf-Outcome-Doc-2018.pdf>.

foreign participation and attendance at Japanese universities and research institutes has increased dramatically. Consequently, in 2018, the Japanese Ministry of Economy, Trade and Industry (METI) developed an e-learning program for academic and research institutes on export control for technology transfers pursuant to the Foreign Exchange and Foreign Trade Act.[18] METI, and other interagency partners, have also expanded their site visits to further target outreach efforts to focus on, for example, AI and additive manufacturing (e.g., 3-D printing) research. The METI university and research institute program has also resulted in numerous dedicated committees and the development of compliance guidelines for science and engineering fields, particularly as it relates to developing best practices for managing intangible transfers of technology (ITT). One set of guidelines, for examples, provides best practice approaches to managing controlled technology for students during and after their university terms.

The Japanese example highlights the importance of continuously revising and innovating technology control outreach to accommodate changes in the technology and threats environment and, more critically, the interplay between the two. Many governments are now in this very process of adapting outreach modalities to identify and respond to emerging technologies.

Research Survey Data

As part of the research underlying this report, the authors have collected survey data on various national efforts to define, assess, and provide outreach for emerging technologies. The survey was distributed to a number of government agencies and stakeholders and answers were collected confidentially. The aim of the survey was to gather information on outreach approaches to emerging technology sectors in light of non-State actor WMD threat and UNSCR1540 obligations. The questions sent as part of the survey are provided in the Annex to this report.

Based on the survey data received, the report authors have noted the following trends:

- Some national authorities have been engaging directly with the research community through a dedicated outreach programs to raise awareness of the threats posed by foreign actors seeking to steal or otherwise illicitly acquire valuable research and to gain unfair economic or military advantage;

- Through some pilot emerging technology outreach programs, some national authorities have already delivered workshops at universities and government labs

18 The e-learning modules can be found at <https://www.meti.go.jp/policy/anpo/daigaku/el/elindex_e.html>.

to help raise awareness on research security issues and how to address them; and

- A smaller number of national authorities are now expanding the program with more tools and more engagement to include the broader parts of the commercial and even financial sectors.

Almost all survey respondents noted that an "effective" outreach strategy in this issue area is predicated on consistent engagement and an open dialogue with stakeholders in relevant sectors in order to raise awareness of threats posed by foreign actors and to understand the challenges and pressures faced by them and how they can be supported. Respondents also noted challenges to emerging technology outreach, including the following:

- The alignment of outreach and engagement efforts and refining and maintaining outreach tools and processes to ensure ongoing relevance;

- Convincing the technology sector that these technologies are national security issues; and

- Discovering the relevant targets for outreach.

It is impossible to define, manage, and protect technology for national security purposes without private sector engagement. In advanced systems, export control authorities have conducted industry outreach and dialogue for decades. However, as with the rate of change of the subject of controls, so to the speed and novelty for outreach to ensure that the national security threats associated with emerging technologies are properly understood and realistically managed. National authorities are still in the process of adopting or modifying outreach methods, and the process will continue to change and adapt to meet new demands and challenges. Based on the trajectory of outreach practices and their effectiveness to date, as well as the need to meet new challenges posed by advancing technologies and non-State actor threats, the report authors have identified and defined a new, more effective generation of evolved outreach, Outreach 2.0.

6. Towards Outreach 2.0

Government have long understood the importance of communicating export control regulation to the private sector. Especially with the passage of UNSCR 1540, many United Nations Member States have taken steps to create some form of outreach program to encourage compliance with export controls, including the publication of internal compliance program manuals (ICP) and best practices. Basic programs, at the least, publish a website where the private sector can find relevant laws, regulations, forms, and

contact information. Additionally, a few additional written forms of outreach (as listed in section four of this report), may be implemented. Finally, a number of companies may be identified, and in-person outreach performed. Nascent outreach program models generally aim to establish baseline programs that provide information on a universal level.

These programs, while meeting the criteria of outreach, may nevertheless not be able to meet the complex and changing landscape of non-State actor WMD threats, especially in light of the way that certain advancing technologies, many of which do not appear on control lists, may be thwarted for nefarious purposes. Simultaneously confronting the security challenges and economic opportunities posed by emerging technologies requires innovative and multifaceted government outreach and related cooperative arrangements with companies, universities, and the investment communities to ensure informed policy and viable compliance procedures.

The current era of innovation is extraordinarily fast paced, with exponential developments in established as well as in cutting edge technologies. In this environment, it is impossible for governments to keep up with change and track the different drivers of change without sustained public-private communication and cooperation. Governments should be pursuing established as well as novel approaches to engagement in order to augment the discovery process, to identify and understand the possible trajectory of emerging technologies as early in the development process as possible. The report authors have therefore identified a new model of outreach, Outreach 2.0, based on certain national best practices and risk trends.

What is Outreach 2.0?

Outreach 2.0 is the outcome of a natural evolution from a basic outreach model to a more effective, impact-driven, participatory approach to exporter outreach. This model is proposed by the authors as a compendium of good practices necessary to meet developing threats, especially those posed by advancing technologies where new stakeholders are involved. Outreach 2.0 can be deployed by United Nations Member States to fulfill their UNSCR 1540 obligations and enhance their ability to thwart non-State actor threats in the context of, among others, emerging technologies.

The best practices that form this approach, their description, and advantages, are described in the table below:

Best Practice	Description	Advantages
Specific Targets	Government authorities assess private sector stakeholders according to risk and threat and organize outreach resources accordingly.	This approach leads to a better use of limited time and resources by prioritizing and focusing on organizations that are at highest risk. This can also lead to differentiating approaches based on risk levels of the organizations involved. Targeting also leads to more effective outcomes by allowing government authorities to focus on organizations that are most in need of effective compliance and awareness.
Calibrated Approach	Government authorities adapt outreach strategies and communication differently to different private sector groups. For example, the written and human communication to multinational companies will differ from that to university research laboratories.	Variation in communication approaches will lead to increased buy-in, understanding, and overall impact than one-size-fits-all messaging. In addition, compliance and awareness target levels as well as ICPs may vary depending on organizational profile.
Flexibility and Preparedness	Outreach methods, messages, tools, and activities change and adapt rapidly to evolving circumstances. Government authorities are prepared, resource-wise, for new challenges.	Especially with the rate of technological advancement, the composition of private sector stakeholders and security threats changes rapidly. A flexible, prepared approach allows government authorities to quickly deploy new outreach resources to new targets, adapt strategies to new threats, and stay prepared for new changes.

Best Practice	Description	Advantages
Variety of Tools	Government authorities use a diverse set of tools and adapt them based on their private sector audience in order to attain maximum impact. Tools include a variety of written, electronic, and human strategies for raising awareness and strengthening compliance.	Different private sector audiences respond differently and may require different strategies to internalize and comply with guidance and regulations from government authorities. A varied and wide-ranging toolbox can allow government authorities to truly target these audience, incorporating innovative communication and messaging tools.
Inclusivity	Including the private, academic and research sectors in policy decisions	Giving exporters a voice and possibility to directly impact policy decisions leads to a better relationship between the public and private sector, a higher level of interest, awareness, and compliance by the private sector due to their involvement, and better information available to government authorities on the impacts of their policies.
Collaboration and Co-development	Working with exporters on the creation of outreach messaging, tools, and activities	Involving exporters in the creation, development, and employment of outreach elements creates further buy in, and makes exporters feel that they have a stake in policy issues. It adds to the accuracy and effectiveness of outreach tools by ensuring that exporters information and points of view are integrated.

7. Conclusion

Integrating Outreach 2.0

The first and most important step involved in encouraging the adoption and integration of Outreach 2.0 elements by UN Member States is awareness. The ongoing risk evolution posed by advancing technologies – and effective responses to these risks – must continue to be part of ongoing discussions, dialogues, research, and other Member State activities. In this regard, international capacity-building programs should find ways to raise awareness of emerging technology threats posed by non-State actors and on the incentives for developing comprehensive, targeted responses – with Outreach 2.0 playing a significant role. In addition, the model could be integrated into existing dialogues and initiatives, such as the Weisbaden Process – where it could enhance and strengthen existing processes and reach.

The United Nations Security Council and the Committee established pursuant to resolution 1540 could take steps to learn from existing national practices with regards to advancing technologies and look towards sharing Outreach 2.0 and best practice examples with UN Member States during their activities. While the resolution 1540 Committee-approved matrices do not list measures relating to advancing technologies, information could be gathered through national reports and other submissions regarding this issue, as well as other UN-sponsored events.

Beyond awareness-raising, the integration of Outreach 2.0 is not possible without exporter buy in and a collaborative approach. From the feedback collected as part of the research effort for this report, the authors found that from exporters' point of view, often regulators understand their own rules but not how exporters comply with them. The exporter point of view matters –and is especially important when considering the different cultures existing in different technology-holder organizations. For example, academic institutions have a culture of being open, sharing information, and collaborating, and regulators' outreach efforts must find ways to communicate and collaborate in ways that are sensitive to this culture. This is critical to meeting the challenges posed by advancing technologies, where traditional one-way, uniform outreach models may check the box of being outreach, but not yield the desired compliance outcome.

Further initiatives, research, and activities are necessary to find ways to bridge this gap and understand how Outreach 2.0 can successfully work in different environments. Doing so may uncover further incentives, outreach best practices, and techniques to enhance compliance, identify new threats, and meet future challenges.

Conclusions

While outreach has been a regular aspect of national export control in practice, the current focus on emerging technologies requires a revised outreach approach in form, content and focus. "Outreach 2.0" represents a prospective model around which to continue not only intra-national but international dialogues on this centrally important topic.

As noted in the United Nations Secretary General's Strategy on New Technologies: "[New and rapidly developing technologies such as artificial intelligence, biotechnology, material sciences and robotics hold incredible promise for the advancement of human welfare. They also hold the potential to generate more inequality and more violence." The report also highlights the importance of outreach to address the associated threats: "We must promote the development of partnerships across a range of actors to increase collective knowledge, test ideas, and expand dialogue."[19]

As non-State actor WMD threats evolve, national strategies precluding them must not only evolve in parallel but aim to stay one step ahead. As noted by the Committee established pursuant to resolution 1540 in its 2016 Comprehensive Review, countries must take measures to ensure compliance with resolution 1540 in light of these new threats. A strong relationship with the exporters, based on communication, trust, and collaboration, is the basis for keeping abreast of new risk environments and countering them effectively.

As technologies advance, new threats emerge, as well as new stakeholders that can be potential targets of non-State actor WMD aspirations. Outreach must evolve to stay ahead of and effectively counteract these threats. Countries should look to integrating Outreach 2.0 elements in order to ensure compliance with international obligations and buttress international peace and security.

19 "United Nations Secretary General's Strategy on New Technologies," United Nations, September 2018, <https://www.un.org/en/newtechnologies/>.