

COURIER

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Out of the Ashes

Zeolverein

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If a Tree Falls in the Forest

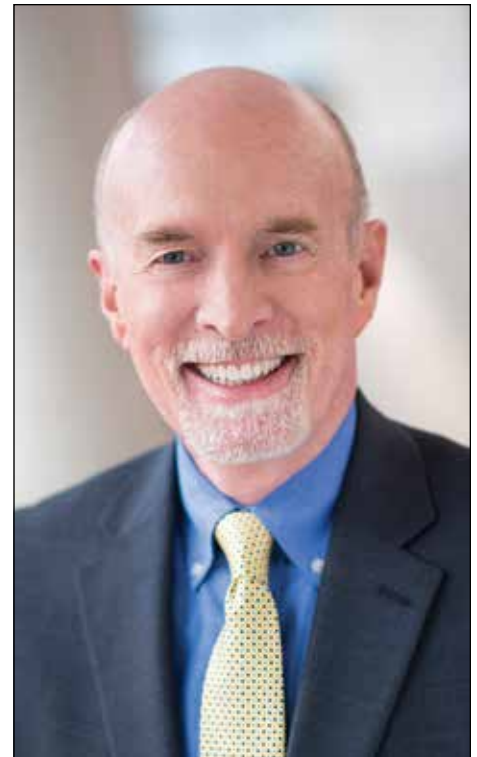
By Joseph McNamara, Editor

Being the life-long communications geek that I am, I find relevant philosophy and meaning in that old cliché: If a tree falls in the forest and no one is there to hear it, does it make a sound? Of course it does. But maybe not. How do we know?

People are bombarded by communications day and night from every direction, cluttering and smothering the planet. Someone out there is sending communications—some in huge amounts and some a lot of little ones that add up—and we are all targets of those little “comm bombs” and have to deal with the noise. Occasionally, we hear something and actually receive a message, and that’s a good thing. Most of the time, however, we tune it out, and the intended communication is never heard—it falls without a sound.

At the Stanley Foundation, we avoid feeding the communications dead zone, and we communicate with a number of select audiences through select channels, helping make a difference through support of our policy-change programming. We know that with communications, less volume is more, especially when it is targeted to specific audiences.

I guess I could make the case that not only are we trying to be more efficient in our communications, but we are actually conserving more of the planet’s resources, conserving noise across the comms spectrums. And in that spirit, I would encourage everyone to conserve a little more—a little less volume and more targeting.



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Cover photo: The former Zollverein coal mine in Essen, Germany, was closed more than three decades ago, but instead of being left in the dust, it was repurposed into a museum and tourist attraction. In 2001, the former mine became a UNESCO world heritage site and now welcomes more than a million visitors each year. (Photo by Thomas Wolf/Creative Commons)



If a tree falls in a forest and no one hears it, does it make a sound? The same thought process can apply to communications: if a message goes out, how do we know it is received? (Photo by John Loo/Flickr/creativecommons.org/licenses/by/2.0/legalcode)

Life Beyond Coal

The Ruhr Region of Germany
Was Once a Mining Stronghold;
Now Residents Are Seeking New Livelihoods

By Emma Bryce



Near the former Zollverein coal mine in Essen, Germany, visitors will come across several canary statues. The art installations are a reminder that long ago, miners would send the songbirds in to alert them to the presence of toxic gases. If a canary stopped singing, miners knew it would be too treacherous to enter. The practice became the genesis of the saying "canary in a coal mine" to signify an early warning. (Photo/Emma Bryce)

Seventy-seven-year-old Heinz Spahn, whose blue eyes are both twinkling and stern, vividly recalls his mining days. Zollverein, the mine where he worked in Essen, Germany, was so clogged with coal dust, he remembers, that people would stir up a black cloud whenever they moved. “It was no pony farm,” he says, using the sardonic German phrase to describe the harsh conditions.

The noise was at a constant 110 decibels, and the men were nicknamed *waschbar*, or raccoons, for the black smudges that permanently adorned their faces.

Today, the scene inside Zollverein is very different. The air is clean, and its 8,000 miners have been replaced by 1.5 million tourists annually. It’s now a world heritage site of the United Nations Educational, Scientific and Cultural Organization, and Spahn, who worked here until the mine shut down on December 23, 1986, is employed as a guide to teach tourists about its history. “I know this building in and out. I know every screw,” he says fondly. Zollverein is also the primary symbol of Germany’s transition away from fossil fuels toward renewable energy, a program called the *energiewende* that aims to generate 80 percent of the country’s energy from renewables by 2050. That program has transformed Germany into the global poster child for green energy. But in the Ruhr region—the former industrial coal belt—do people welcome the change?

Spanning roughly 1,700 square miles, the Ruhr valley lies in the state of North-Rhine Westphalia, made up of a matrix of 53 cities that sprang up around coal mines in the 1800s. At their height in the 1950s the mines employed about 600,000 workers, entwining the region’s identity with coal. “Coal runs through my whole life,” says Spahn, whose grandfather, father, and two sons were miners too. But in the 1970s, as coal imports from other countries drove up

the price of German production, it became unsustainable for the government to keep subsidizing the mines. And so the phaseout of coal began.

The Transition Away From Coal

Today, just two hard-coal mines remain, and in 2018 they’ll both be shut down. Germany still extracts soft brown coal called lignite at hundreds of opencast mines across the country, but with the German federal election coming up in September, the new government will likely turn its attention to this type of coal and will set a deadline for its phaseout too. That will dock another several thousand jobs in the Ruhr alone, forcing the government to consider how to achieve a fair and final phaseout and the role of renewable energy in that.



Heinz Spahn, who worked at Zollverein until the mine shut down on December 23, 1986, remembers when the air there was clogged with coal dust. Now the air is clean, and Spahn teaches visitors about Zollverein’s history. (Photo by Emma Bryce)



Zollverein miners are seen in the 1970s during a break. At their peak, the mines in the Ruhr valley employed about 600,000 workers, entwining the region's identity with coal. But in the 1970s, coal imports from other countries drove up the price of German production and it became unsustainable for the government to keep subsidizing the mines. This began the phaseout of coal. (Photo © Fotoarchiv Ruhr Museum)

The transition away from hard coal has left a lingering legacy in some cities, where unemployment can exceed 10 percent. But despite the heavy historical personal toll, for hard coal, overall "it was really a soft and just transition," says Stefanie Groll, head of environmental policy and sustainability at the Heinrich Boll Foundation in Berlin. "In the Ruhr area, union representatives and local politicians worked out a plan to compensate and requalify people who worked in the coal industry."

For families like Spahn's, it was a success: the mines where his sons worked launched a proactive campaign in 1994 to train employees for different careers. "My one son is now a professional security guard and the other is a landscaper," he says.

At Zollverein, the viewing platform offers a 360-degree view on the landscape-level change the transformation has brought about. The Ruhr's low-built cities are set among lush forests and parks. Amid smokestacks stand the spires of wind turbines. Zollverein's 55-meter-high mine shaft itself makes a striking contribution to the landscape. In 2000, Germany's former President Johannes Rau dubbed it "the Eiffel Tower of the Ruhr"—and in doing so highlighted an important trend: the cultural rebranding of the Ruhr's industrial history.

People 30 years ago would have scoffed at the thought of holidaying here, says Frank Switala, a local tour guide who works at Zollverein. "Now the number of hotels has increased. There are new museums. We have five philharmonic orchestras in the Ruhr area, and so many theaters." The mines themselves have become a cultural stage: a museum and gallery at Zollverein alone attracts 250,000 visitors a year, and several mines now host music concerts and food and cultural festivals. In the nearby city of Bochum, an old industrial plant, now the site of the German Mining Museum, is set somewhat incongruously in an inner-city suburb. But its



The Ruhr has become an attractive place for businesses to invest, says Frank Switala, a local tour guide who works at Zollverein. But the coal mine has left its mark; after centuries of tunneling below ground, Switala said the earth below the Ruhr valley is like "Swiss cheese" and sinkholes are a regular occurrence. (Photo by Emma Bryce)

cultural presence appears to have boosted, not undermined, the area's status: the surrounding homes are stately, flanked by lush gardens. The change hasn't gone unnoticed, for the Ruhr was officially named Europe's cultural capital in 2010.

Zollverein, like many former mines, is now also home to companies and creatives. Artists, jewelry designers, choreographers, design firms, and tourism companies are just a sampling of those who have made the trendy industrial space their home. The Ruhr has become an attractive place for businesses to invest, says Switala. And yet moving away from coal hasn't just been about economic revival. "The earth beneath this region is like Swiss cheese," he says. Riddled with tunnels from centuries of mining, the geography has become so brittle that the region regularly battles with sinkholes. Groundwater flooding the old tunnels now has to be laboriously pumped out.

The mines' legacy of pollution also became untenable. "Every evening my grandmother tested the wind and then decided whether or not to leave the washing out," Switala recalls. Otherwise, her clothes would be black in the morning. Knowing the health risks, his grandfather who had worked in the mines all his life adamantly kept his five children out, Switala says. "That was quite common in that generation. You wanted your kids to have a better life than you did."

The Transformation of the Mines

Roland Sauskat, a social worker with a local soccer club called Rot-Weiss-Essen, shares a similar family story. In the neighborhood of Gelsenkirchen-Horst, he walks around the grounds of Nordstern, the former mine—now museum, events space, and business park—where his father and grandfather spent their working lives. His grandfather started mining when he was just 14, at a time when they still used horses underground to haul coal. He died of the *schwartzte lunge*—black lung—a disease triggered by the accumulation of small rock particles inhaled during mining, which ultimately causes tissue death in the lung. His father died of lung cancer. Despite this, Sauskat doesn't recall his family expressing any bitterness about the work. "It was a job," he says bluntly. Ironically, Sauskat himself was spared this fate because of childhood asthma, which made him unfit for the mines, a problem he says was common among the region's youth. In any case, his family wouldn't have wanted him to work in the mines. "Every worker here said my son will do better with his life," he notes, as we ascend Nordstern's mine shaft. At the top of Nordstern's mine shaft, an imposing, 18-meter-high statue called *Hercules* stands as a symbolic tribute to the miners: erected there by a German artist in 2010, he gazes over the Ruhr, observing the regional transformation as if he's curating it.



The swimming pool at Zollverein was created in 2001 as part of the art project "Contemporary Art and Criticism" by Frankfurt-based artists Dirk Paschke and Daniel Milohnic. The pool now is a popular meeting point for children and young people in Essen, Germany. People 30 years ago would have scoffed at the thought of holidaying here, says Frank Switala, a local tour guide who works at Zollverein. (Photo © Jochen Tack/Stiftung Zollverein)



The Science Park in Gelsenkirchen, Germany, was built on the site of a former coal-powered steel plant. The building's glass facade looks over a man-made lake flanked by rolling lawns, and its roof is outfitted with 900 solar panels that generate a third of the building's electricity. Hildegard Boisserée-Frühbuss (inset), project manager of the park, says the building houses 55 businesses mostly focused on science, technology, and renewable energy development. (Photo by Unkel/ullstein bild/Getty Images, and photo of Boisserée-Frühbuss by Emma Bryce)

Six miles south, near Essen—one of the region's largest and most prosperous cities, whose center was once home to more than 20 mines—Sauskat points out signs of environmental change that the transition has ushered in. In the district of Altendorf, a former coal and steel production site is now a lake at which people walk their dogs and have picnics, he says. It's part of the wider Emscher Park initiative, a multimillion-euro project to restore, create, and connect green spaces along a 300-square-mile span of the Ruhr that was once devastated by mining.

The cities show signs of other, more pragmatic economic changes too. In Gelsenkirchen, locals experience some of the highest unemployment rates, hovering around 15 percent. Its quiet streets betray signs of economic struggle, with many businesses boarded up. But since the early 2000s, it has been trying to revisit its former industrial prosperity with the Science Park, a hub for regional business, which lies on the site of a former coal-powered steel plant. The building's glass facade looks over a man-made lake flanked by rolling lawns, and its roof is outfitted with 900 solar panels that generate a third of the building's electricity. "Gelsenkirchen was called the city of a thousand fires. It became the city of

a thousand suns," a nod to the park's huge solar roof, says Hildegard Boisserée-Frühbuss, project manager at the park. The building now houses 55 businesses mostly focused on science, technology, and renewable energy development. Boisserée-Frühbuss spends her time working with local colleges and schools to give the youth exposure to these fields, in the hopes that they'll be inspired to find employment there. "Once it was a steel foundry. Now the Science Park is a thinking factory," she says.

Questions of Employment

With the move toward renewables, how much the Ruhr will benefit—having sacrificed so much toward this clean energy goal—has become a primary focus. There are 330,000 people employed in the renewable sector in Germany; 45,000 of those are in North-Rhine Westphalia, and that number will grow, predicts Jan Dobertin of the National Association of Renewable Energies, in North-Rhine Westphalia (LEE NRW). "The Ruhr region is now one of the biggest providers of green economy—such as efficiency technologies, recycling, or renewable energy," Dobertin says. LEE NRW works with regional energy companies to build better political frameworks for integrating renewables



The coal-fired power station fed by the mine Prosper-Haniel spews emissions into the air on February 6, 2007, in Bottrop, Germany. Prosper-Haniel, one of the two last hard-coal mines in Germany, is scheduled to close in 2018. Ahead of that closure, a consortium of local universities, consultants, and mining operators is exploring the chance to turn the plant's deep mine shaft into a hydroelectric storage facility. (Photo by Ralph Orlowski/Getty Images)

in the Ruhr. "Our argument is that the renewable energy sector is much more employee intensive" than fossil fuels, Dobertin says. A recent poll of Ruhr residents, carried out by LEE NRW, suggests that it has the public on its side: 64 percent of those polled want renewables to be a priority for the state government of North-Rhine Westphalia.

In keeping with this trend, just outside the small city of Bottrop, a plant called Prosper-Haniel, one of the two last hard-coal mines in Germany, has become the front line of a renewables experiment. Ahead of its closure in 2018, a consortium of local universities, consultants, and mining operators is exploring the chance to turn the plant's deep mine shaft into a hydroelectric storage facility. The plan is at a preliminary, exploratory stage, cautions Andre Niemann from the University of Essen-Duisburg, who is leading the research team. But if it works, it could store and provide power for over 400,000 local homes. He's motivated by the chance to revive the industrial landscape he grew up in. "The question will be, what did we do to give the region back to the people?" he says.

What the project can't change is the fate of the 2,600 employees at Prosper-Haniel who will lose their jobs next year. If the hydroelectric project goes through, it won't be a major employer, Niemann says. This concern extends to lignite mining, which is predicted to go by 2040, officially closing the era of coal. "There's no officially approved 'just transition plan' for the three remaining lignite regions in Germany," cautions Groll. That will hopefully be mapped

out when lignite's future is decided, which some see as an opportunity to correct some of the wrongs that were committed during the transition from hard coal, like the legacy of unemployment in some cities. "We don't want to repeat its mistakes," Dobertin says. He's adamant about the potential of renewables to improve the Ruhr's fate, though he understands that this threatens its identity, especially for its older generation. And he does ponder how his grandfather, the last miner in his family, would have felt about his anticoal stance. "But I think ultimately my grandfather would have been happy about it, because we have to do something about climate change, and renewables are one big solution for this challenge."

Reflecting on this future, Heinz Spahn, sitting just meters away from the machine where he toiled for 26 years, shares his views. "Eventually the [coal] legacy will die out, and that makes me sad. But I have made my peace with it," he says. "I am very happy that the Ruhr region has become so green and healthy. I am glad the youth today will have a better childhood than I did."



Emma Bryce is a London-based freelance journalist who writes about science and the environment for the *Guardian*, *Wired UK*, *Audubon*, *Anthropocene*, and others. She reported from Marrakech, Morocco, on the 2016 climate talks as part of an International Reporting Project fellowship, organized in collaboration with the Stanley Foundation.



A woman protests US President Donald Trump's decision to pull out of the Paris climate accord on June 1, 2017, in New York. Hundreds of city leaders reacted to Trump's decision with defiance, saying they would continue to honor the pledges made in the deal. (Photo Jewel Samad/AFP/Getty Images)

Urban Breakthrough

Cities Increasingly Asserting Themselves
on Global Governance Stage

By Francie Williamson, The Stanley Foundation

“I was elected to represent the citizens of Pittsburgh, not Paris,” President Donald Trump declared at the White House in Washington, DC, on June 1, 2017, after announcing he would pull the United States out of the Paris climate change agreement.

Within minutes, Pittsburgh’s mayor, Bill Peduto, was responding to the president on Twitter.

“The United States joins Syria, Nicaragua & Russia in deciding not to participate with world’s Paris Agreement. It’s now up to cities to lead,” Peduto tweeted. “As the Mayor of Pittsburgh, I can assure you that we will follow the guidelines of the Paris Agreement for our people, our economy & future.”

Friction among state and substate actors is nothing new. But climate change is one issue where the role of urban leaders is growing in importance, according to Ian Klaus, a former senior adviser for global cities at the US Department of State and deputy US negotiator for Habitat III, the 2016 UN Conference on Housing and Sustainable Urban Development.

In a phone interview with the Stanley Foundation in June, Klaus said the decision of hundreds of American city leaders to diverge from the president’s official stance on the Paris Agreement was a “remarkable moment in diplomacy.” But it also highlighted the necessity of other multilateral players, such as civil society and nonstate actors, to help cities implement climate action. Scores of university and business leaders also have declared their support for the Paris Agreement, along with networks such as the C40 Cities Climate Leadership Group and the Global Covenant of Mayors



Ian Klaus

for Climate & Energy, and organizations such as Bloomberg Philanthropies have pledged financial assistance.

Even with the support of civil society, nonstate actors, and other substate leaders such as governors, however, Klaus said that it will be a “great challenge” for US cities to implement the Paris Agreement.

Institutional Holes

“In terms of expertise, cities need to understand the politics of the United Nations, especially if they’re going to step in and say they’re going to try to honor the Paris Agreement to the degree they can, and interact often through an arbiter at the United Nations,” Klaus said. “That’s very complicated because they’re also running their own cities and have limited budgets. So from the city standpoint there’s a question of how and when they engage and doing that effectively and efficiently in a way that serves their cities well.”

“Take the United Nations or the IMF [International Monetary Fund], or the World Bank, or the OECD [Organisation for Economic Co-operation and Development]—there’s a question of whether the diplomats and the bureaucrats and the technocrats in those organizations understand urban issues. So in that space, which isn’t necessarily a process, but rather a shared language, I think there’s a tremendous amount of work that needs to be done,” Klaus said.



Mayors of major cities, including Paris, Mexico City, Rio de Janeiro, Amman, Milan, and Los Angeles, ride Ecobici shared bikes through the streets of Mexico City in November 2016 during the C40 Mayors Summit. The C40 network of 91 cities is committed to urgent action on climate change. City leaders increasingly are finding common ground on a variety of issues. (Photo courtesy of C40)

Klaus said the world's multilateral governance structures such as the United Nations, OECD, World Bank, and IMF were built to work at the nation-state level.

"If you want to, as these organizations do, solve some of the challenges that we're all facing, it's paramount that they figure out how to work on the city level. There are all sorts of challenges that can be addressed at the city level, but our international institutions are geared to operate more with capitals."

That isn't to say, however, that these institutions should stop dealing with nation-states. "The Westphalian system and the nation-state aren't over, nor should we want them to be," Klaus said. "They're the bedrock of an international order that's allowed for a period of peace and stability that is nearly unprecedented. But you have to recognize that if you care about anything from human rights to health to economic opportunity, more people are in cities and more people will be in cities than ever before."

A Closer Relationship

According to the 2016 World Cities Report from UN Habitat, by the year 2030, more than 60 percent of the world's population will be living in urban environments.

"Some of the key global macro trends are making cities and the voice of mayors and city hall more important than

ever before," Klaus said. "As an example, if you are in the innovation economy and you're thinking about ridesharing or apartment sharing, state governments, provincial governments, and city governments often are the regulatory keys. And so we have a shift in a lot of issues, from climate to the nature of economic growth, that I think is making cities also more important. You have this convergence of population, demographics with other trends in the economy, and security and climate."

The relationship that citizens have with their cities also often diverges from their view of national government, Klaus said, and differs "all over the world."

"I do think that there are some interesting advantages between municipalities and their citizens and/or residents that nation-states increasingly have a harder time with," Klaus said. "If you go back to Jane Jacobs and [her book] *The Death and Life of Great American Cities*, she talks about how in megacities, or very large cities, you need to have wards or smaller districts, and the fundamental notion that scale allows a certain type of expertise, a certain type of nuance, and a certain level of depth in relationships to govern. And that gets really hard at 330 million people or 500 million people or 1.3 billion people if you're a national capital trying to have the nuance, have the sensitivity, and have the personal relationships."



Green lights illuminate the Angel of Independence monument in Mexico City in support in the Paris climate accord on June 1, 2017, after US President Donald Trump announced his decision that the United States will withdraw from the accord. Leaders of a number of global cities lit up their monuments in green that day to show their continued support for the Paris accord. (Carlos Jasso/Reuters)

“And so I think, especially with some new forms of technology, citizens can have a much closer relationship with their city hall and with their civic leaders than they can with their national leaders. That’s an advantage; it allows people in municipal government to build trust, for instance. It allows citizens to verify whether or not what their mayors or other city leaders are saying is actually happening.”

The Role of Partners

Klaus said the challenges that cities are facing often have a global origin but require action on the local level. So working with partners on the world stage can be of great assistance.

“I’m told from the mayors I know that mayors definitely have a sense of being in a special club in terms of the pressures that they’re under because they simultaneously have to operate within their national hierarchical structures, they’re facing global challenges, they’re facing local politics, and are really trying to make their cities work,” Klaus said. “It’s not necessarily heavily politicized; they’re trying to keep the cities functioning and inclusive and safe. And so I think they can share a vision that isn’t too political, and then when you get beyond the politics, you’re having conversations about policy. And that’s why they work together so much, because they’re looking for policy solutions and policy innovations that work. Also, mayors are often quite blunt, which I think makes them unique in international gatherings and certainly lets them stand out and draws them to each other.”

But when working on the global stage, city leaders need buy-in from citizens, as well as civil society and nonstate actors, Klaus cautioned.

“If you think civil society in part represents our cities, it’s even more important than ever to make sure they have a presence in the room and that their expertise is brought to bear through policy papers, statements, being present in the hall, and having informal discussions with negotiators,” Klaus said.

It’s Not Just Cities

Klaus anticipates that substate diplomacy will only grow in the coming years. In fact, US cities aren’t the only ones increasingly engaging with foreign nation-states. After President Trump announced the US departure from the Paris Agreement, California Governor Jerry Brown announced the formation of the US Climate Alliance, journeyed to China for multilateral discussions, and announced a 2018 global climate summit in San Francisco. Also, the New York Times reported that Canada has begun engaging with US cities on climate action.

“I think we’re increasingly seeing that cities and states and counties, and provinces in other countries, can take action. And, obviously, because of the pressure they are under from their own citizens, because of the moral calling to deal with an issue such as climate change, I think we’ll see more action than ever for sure,” Klaus said. “It’s a tremendous moment.”



A demonstrator is detained by security forces on July 10, 2017, during a protest against Venezuelan President Nicolas Maduro's government in Caracas, Venezuela. People have been demonstrating in the streets in opposition to the government almost daily since March. Scores have died in clashes with security forces. (Carlos Garcia Rawlins/Reuters)

Crisis Cripples Venezuela

Meaningful International Action Missing
Amid Chavismo's Unwillingness to Protect

By Andrés Serbin and Andrei Serbin Pont

The end of the commodities boom is having a devastating impact on the Venezuelan economy. The drop in international oil prices that began toward the end of 2014 has also been accompanied by inadequate social planning, expanding state control of the economy, and skyrocketing levels of corruption and mismanagement among governmental officials and the military.

As a result, the Venezuelan economy is in shambles, corruption and violence are rampant, and the Chavismo revolutionary project launched by then-President Hugo Chávez is floundering, while the economic, political, and humanitarian crises continue to grow.

As political unrest and violence escalate in Venezuela, the health system is deteriorating, food scarcity is growing, and national institutions continue to fail to support adequate basic living conditions. According to a 2016 survey, *Encuesta Sobre Condiciones de Vida en Venezuela* (Survey on Living Conditions in Venezuela), poverty increased by 34 percent from 2014 to 2016, while extreme poverty increased from 24 percent in 2014 to 52 percent in 2016. The latest figures from 2017 are staggering, indicating that 82 percent of Venezuelans are living under the poverty line, the highest rate in its history and making the country one of the poorest in the region. The survey also reported roughly three in four Venezuelans have lost weight involuntarily, averaging 19 pounds per person. (See “Resources” at end.)

As people turn to the streets to protest, they are violently repressed by police, the armed forces, and paramilitary groups. Since March 2017, over 100 people have died as a result of state-led repression and hundreds of others have been imprisoned for exercising their constitutional rights, while opposition leadership is actively persecuted and imprisoned by security and paramilitary forces and

intelligence services. Furthermore, human rights violations have become widespread when citizens are detained, and intelligence services have set up clandestine detention centers such as “La Tumba” (The Grave) where political dissidents are illegally kept without informing the judiciary and then isolated from any outside contact for days or weeks while being physically and psychologically tortured. Other detained civilians are subjected to speedy military trials and imprisoned in military installations.

On the streets, state-led violence is not limited to repression of violent protest, but also includes generalized targeting of entire neighborhoods considered “opposition neighborhoods.” The Venezuelan government seems not only unable but also unwilling to provide peaceful solutions to the crisis, which in turn escalates national-level tensions among a diversity of actors, including many within Chavismo ranks.

Worries surrounding the situation in Venezuela are not only linked to these dire circumstances but also to the language and discourse used by the Venezuelan government. While historically Chavismo has waved the flag of equality and inclusion, its discourse toward the opposition has been one of polarization, exclusion, and discrimination. In the context of escalating political, social, and economic conflict, the existence of entrenched discrimination based on the use of exclusionary ideology that constructs identities in terms of “us” and “them” is an alarming indicator for the

international community. The risk of further repression and human rights violations is exacerbated with the common use of pejorative and discriminatory language and the deliberate tagging of opposition groups as terrorist and/or subversive organizations that are seeking to overthrow the government. If Latin American history in the 20th century can teach us an important lesson it is that when authoritarian regimes categorize opposition in broad terms such as “terrorists,” it is a precursor step toward the escalation of violence, increased repression, and likely justification of state-led atrocities.

Furthermore, Chavismo has been very effective in coopting state institutions, and those it cannot exert control over it has tried to outlaw, as was the case with the National Assembly in early 2017. This legislative branch of the government has been controlled by the opposition majority since January 2016, when parties opposing Chavismo won legislative elections by a landslide. Since then, the executive and judicial powers have systematically attempted to annul the National Assembly, overrule its decisions, and reduce its overall power.

In the meantime, President Nicolas Maduro, who carried forward his predecessor’s policies and ideology, has refused to hold a recall referendum to consult the population



Venezuela’s President Nicolas Maduro speaks on July 15, 2017, during a ceremony at the National Pantheon in Caracas. Maduro, the successor to the late socialist leader Hugo Chavez, has refused calls for a recall referendum and regional elections. He also wants to rewrite the nation’s constitution. (Miraflores Palace photo via Reuters)

on whether he should continue in office, although the opposition has fulfilled all the steps required to call that referendum. He has also postponed regional elections, arguing that the dire economic situation makes it financially inviable. While he has proposed that a National Constituent Assembly draft a new constitution, the process has been handled in such a way that participants in the assembly are those sympathetic with Maduro’s government. It would also create a supraconstitutional power that would allow



A volunteer of the Make the Difference (Haz La Diferencia) charity initiative gives a cup of soup and an arepa to a homeless child on March 5, 2017, in Caracas. As political unrest and violence continue in Venezuela, food scarcity is growing and the number of people in poverty is increasing. (Marco Bello/Reuters)



Dozens of members of the Venezuelan Warao indigenous community pass the time outside a shelter in Boa Vista, Brazil, on February 11, 2017. The community fled Venezuela because of lack of food as well as growing lawlessness. The influx of Venezuelans into the Brazilian state of Roraima, where Boa Vista is located, has been so great that the local health system has been unable to cope. (Cesar Munoz Acebes/Human Rights Watch)

Chavismo politicians to fully concentrate power and overrule all opposition actions, which would contradict the 1999 Constitution.

The analysis of the Venezuelan crisis cannot be reduced to incidents inside the borders of the Caribbean state: its deepening humanitarian crisis is overflowing its borders as hundreds of thousands of Venezuelans leave, seeking better living conditions in neighboring countries. The main flow of emigrants has been toward Colombia, reversing the trend that lasted for decades of Colombians escaping their internal conflict and seeking refuge in Venezuela.

In the north of Brazil, the influx of Venezuelans has also increased exponentially, as people escape not only the severe shortages of food and medication but also the lawlessness of one of Venezuela's most remote areas. A sanitary emergency has been declared in the Brazilian state of Roraima because the local health system is unable to cope with the massive arrival of Venezuelans. Brazilian Foreign Affairs Minister Aloysio Nunes has visited the expanding Venezuelan camps, and in February of this year, Dutch Foreign Affairs Minister Bert Koenders visited Aruba and Curacao and said those islands must remain "very alert"

when it comes to the situation in neighboring Venezuela. In April he discussed preparing for increasing numbers of Venezuelan immigrants, including drafting a crisis plan that draws in contacts with the International Organization for Migration and the United Nations High Commissioner for Refugees. At the same time, governmental concerns regarding the flow of Venezuelan refugees are rising in Panama and in Trinidad and Tobago off the coast.

The regional repercussions of the crisis are not only humanitarian but also commercial and political. Countries with deep-rooted economic ties to Venezuela are suffering the consequences of the acute recession there, reducing their exports and, in many cases, the import of cheap Venezuelan oil previously provided by Petrocaribe to maintain Venezuela's regional network of political support. This network extended throughout the Caribbean and Central America, and it continues to be useful in stalling efforts by the Organization of American States (OAS) to apply the Inter-American Democratic Charter in Venezuela. Other regional organizations such as the Union of South American Nations (UNASUR) and the Community of Latin American and Caribbean States have proven unwilling or unable to bring about solutions, many times as a result of their

support for the Venezuelan regime, which has molded their dialogue proposals into actions that have been interpreted by the Venezuelan opposition as lifelines for a dying regime.

While the regional community has been actively denouncing human rights violations and attempting to pass resolutions in the context of the OAS, these actions have had little to no impact on the decisions of the Venezuelan government. The attempt by the Vatican to support a dialogue initiative by three former presidents within the institutional context of UNASUR also failed to yield any results in late 2016. The regional and international strategy toward Venezuela may need to shift from purely “name and shame” to one aimed at exerting pressure on international actors that support the continuation of the Venezuelan regime, in addition to creating new spaces for domestic dialogue through a mechanism like a group of friends and using quiet diplomacy to engage Venezuelan officials and facilitate a process of democratic transition.

These diplomatic measures are particularly difficult tasks because of the existing political polarization and the reluctance of the Venezuelan government to accept any conditions to promote dialogue or a joint solution with the opposition. The fragility (or complete lack) of adequate institutional mechanisms to foster dialogue and compromise make it extremely difficult for any attempt to sort out the situation by identifying

transitional forms of government that could lead to the reestablishment of governance or by identifying policies that can improve the situation for Venezuelan citizens.

Third parties that could act as facilitators or honest brokers in the process are mistrusted by both sides. As a result, it seems that if there is no possibility of developing some sort of dialogue with the most rational sectors of the parties in conflict, inevitably, some sort of external intervention will be required to stop the escalation of violence and the eventual bloodshed of a civil war. The pending question is: Are the international community in general and the United Nations in particular—after the previous failed attempts—willing to assume or capable of assuming responsibility and addressing the growing domestic crisis in Venezuela and its regional impact?

Andrés Serbin is president of the Coordinadora Regional de Investigaciones Económicas y Sociales (CRIES), and Andrei Serbin Pont is research director at CRIES.

Resources

Frank Muci, “*ENCOVI 2016: A Tragedy in Numbers*,” *Caracas Chronicles*, March 2, 2017.



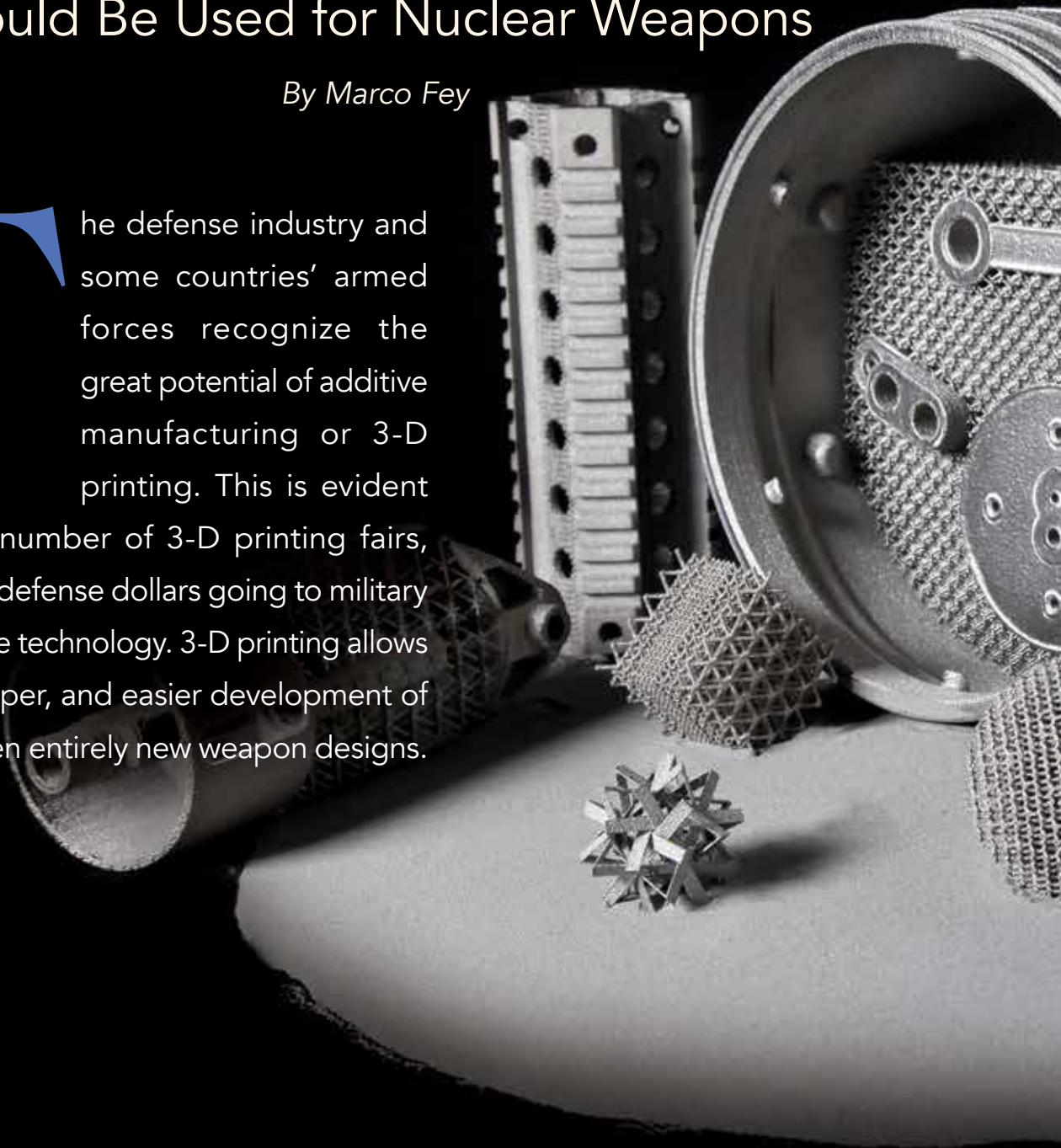
Vicente Fox, former president of Mexico, observes the voting process at a polling station during a symbolic Venezuelan plebiscite on July 16, 2017, in Caracas. The opposition alliance’s unofficial plebiscite sought to challenge the legitimacy of President Nicolas Maduro’s plan to rewrite the constitution. After Fox left the country, Maduro’s government said he was no longer welcome to visit in yet another sign that third parties that could help broker a solution to the crisis in Venezuela are mistrusted. (Carlos Becerra/Bloomberg via Getty Images)

3-D Printing Capabilities Increase

There Is Growing Concern the Technology Could Be Used for Nuclear Weapons

By Marco Fey

The defense industry and some countries' armed forces recognize the great potential of additive manufacturing or 3-D printing. This is evident in the growing number of 3-D printing fairs, printathons, and defense dollars going to military applications of the technology. 3-D printing allows the quicker, cheaper, and easier development of weapons and even entirely new weapon designs.



This applies to the full range of weapons categories: small arms and light weapons (e.g., guns and grenade launchers), conventional weapon systems (e.g., drones and missiles), and possibly even weapons of mass destruction.

3-D printing is increasingly adopted by various industries for rapid prototyping, the production of very complex objects in small numbers, and even the rapid production of end parts. Because of the features associated with 3-D printing—particularly the high flexibility—the technology is, in a sense, the epitome of dual use: the same 3-D printer can produce both tools and weapons.



A growing concern in the international security realm is that 3-D printing could help a proliferating state in its quest for a secret nuclear weapons program. Metal additive manufacturing—the printing of metals such as aluminum, titanium, and maraging steel in particular—could have an impact on a country's path to the bomb.

3-D Printing and Nuclear Proliferation?

No one argues that with present technology, a complete nuclear weapon could possibly be printed. It is simply impossible to print the critical part of a nuclear weapon: the nuclear core containing fissile material, tamper, and explosives. It also is impossible to print entire gas centrifuges for the enrichment of uranium. But that does not mean that 3-D printing should not be carefully watched from a nonproliferation perspective. Additive manufacturing (AM) may, in fact, present serious challenges for the nuclear nonproliferation regime sooner than is currently believed. Should the technology continue to advance as rapidly as it has over the past couple of years, 3-D printing could make the clandestine pathway to the bomb easier in five ways:

1. The technology could significantly increase states' indigenous manufacturing capabilities. Certain components and materials needed for a nuclear weapons program, which are difficult to obtain, could be manufactured additively.
2. The wider diffusion of AM processes could have an indirect impact on proliferation, as it increases a proliferator's autonomy. A decreased dependence on imports of, for example, spare parts for energy or other high-tech sectors reduces the effectiveness of international sanctions regimes. This would potentially undermine sanctions and, with that, a central instrument of nonproliferation.
3. 3-D printing significantly decreases development cycles and lead times to a degree that, for an indigenous nuclear weapons program, trial and error may substitute for a lack of engineering skills and expertise in metalworking.
4. 3-D printers, software, and 3-D scanning technology could facilitate the easier transfer of know-how and construction plans because of AM's high proportion of cyberautomation.
5. AM might also decrease the footprint of production facilities for nuclear weapons parts, which might make it harder to detect illicit activities.

Electron-beam additive manufacturing produced the fully functional lightweight robotic hand and other parts pictured here, which were made from titanium powder. (Oak Ridge National Laboratory Photo)

Mitigating the Risks

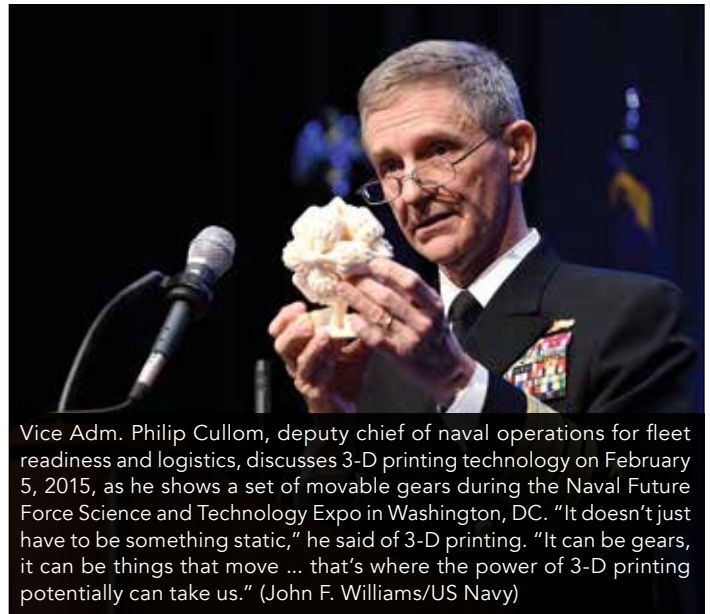
What, then, can be done to balance the huge opportunities of 3-D printing with the risks and challenges its further development, adaptation, and diffusion present to nuclear nonproliferation efforts? The lowest hanging fruit is awareness-raising. Export control authorities, customs officers, law enforcement agencies, and weapons inspectors of the International Atomic Energy Agency (IAEA) should be able to adapt to new manufacturing setups for illicit and clandestine activities but also to new supply chains. Awareness should also be raised in the academic context. Just as the life sciences have dual-use research of concern measures, engineering departments at universities operating 3-D printers should have policies in place that minimize the risk of malevolent use of their equipment and know-how.

Industry self-regulation and best practices are other low-hanging fruits. Some major technology providers already refrain from doing business with certain states or suspicious companies. National and transnational industry associations could pick up on that and adopt sets of best practices on where and when to refrain from exporting printers, software, materials, or know-how.

Strengthening cybersecurity is also essential. The danger that digital build files could proliferate as a result of cyberespionage or theft must be minimized through more-effective protection of critical IT infrastructures, including the 3-D printers' firmware, as well as through the compartmentalizing of build files, their decentralized storage, and encryption. Smart contracting technology could be applied as a further safeguard that prevents a stolen file from being printed.

Incorporating safeguards against unintended use directly into software, hardware, and even materials is somewhat more complicated and would require creative solutions. Matthew Kroenig and Tristan Volpe propose incorporating a single-use mechanism into digital build files that corrupts them after they have completed their task once. With regard to AM hardware, Kroenig and Volpe propose placing unique IDs on metal printers and corresponding markings on every object produced by these printers. This could be helpful for tracking and tracing the whereabouts of high-end printers, possibly by the IAEA.

Finally, Kroenig and Volpe and Grant Christopher propose amending existing export control guidelines with technological parameters of AM machines, for example, printers' axes and power of lasers. As to printing materials, most special metallic powders are already on the European Union dual-use control list, with the notable exception of maraging steel powder. The



Vice Adm. Philip Cullom, deputy chief of naval operations for fleet readiness and logistics, discusses 3-D printing technology on February 5, 2015, as he shows a set of movable gears during the Naval Future Force Science and Technology Expo in Washington, DC. "It doesn't just have to be something static," he said of 3-D printing. "It can be gears, it can be things that move ... that's where the power of 3-D printing potentially can take us." (John F. Williams/US Navy)

Nuclear Suppliers Group (NSG) has put AM on its agenda, as have other export control regimes. However, finding a sustainable approach on controlling the spread of additive manufacturing is difficult. For one thing, the genie is already out of the bottle, as many countries outside the NSG have indigenous 3-D printing industries and technology providers. Moreover, AM technology advances at such a rapid pace that the export control regimes would constantly have to chase such developments and amend the control lists. And finally, there seems to be no real sense of urgency within the export control regimes, as there remain doubts regarding the technology's maturity. (See "Resources" from Kroenig and Volpe and Grant Christopher at end.)

Hence, the search for viable means that would minimize the security risks associated with 3-D printing without at the same time minimizing its opportunities should continue, with a greater sense of urgency. It requires more debate and input from all stakeholders. Above all, authorities, decision makers, industry, and academia should place the security policy dimension more firmly on the agenda.

Marco Fey is research associate in the International Security Department at the Peace Research Institute Frankfurt, focusing on US foreign policy, arms control, and emerging technologies.

Resources

[A version of this article](#) originally appeared on the blog of the Peace Research Institute Frankfurt.

Matthew Kroenig/Tristan Volpe (2015): 3-D Printing the Bomb? The Nuclear Nonproliferation Challenge, *The Washington Quarterly*, 38: 3, pp. 7-19.

Grant Christopher (2015): 3-D Printing: A Challenge to Nuclear Export Control, *Strategic Trade Review*, 1: 1, pp. 18-25.



Security by Design

Emerging Technologies Require New Approach
to Oversight, Governance

*By Anja Kaspersen,
senior adviser with the Hastings Center*

Art by wildpixel

Editor's note: Nuclear weapons have been around for 70 years. They are an old technology, and the norms and institutions that govern them are fairly well established. Emerging technologies, however, could create new problems for governance, disrupt those institutions, and force the world to rethink how to avoid the use of nuclear weapons. The Stanley Foundation's new programming focuses on this problem. This article explores the dynamic landscape of technology governance—to understand solutions relevant for nuclear issues and for international security more broadly.

The world often waits to regulate weapons until after they have had a shattering impact. You see this lag today in calls for control and restraint after cyberattacks in Ukraine or following the expanded use of lethally armed drones in war zones around the world. But the pace of new weapons development is accelerating, technology governance is lagging further behind, and geopolitical relations are

growing tenser. These trends are part of a fundamental transformation in international security and the future of warfare.

It is more necessary than ever to get ahead of these trends and seek solutions before the world experiences intolerable consequences of newly weaponized technologies. Doing this will require working with nontraditional stakeholders to redesign the global dialogue on technology governance.

Existing Challenges

Multilateral efforts to mitigate the severe risks of certain weapons are stovepiped and disjointed. Different kinds of threats—such as nuclear, chemical, biological, cyber, or lethal autonomous weapon systems—have their own international committees, conferences, and state party meetings. Each has different configurations of states involved and often reflects a similarly fragmented national response to technology.

This structure no longer makes much sense, as new threats are emerging primarily at the intersections of technologies. For example, imagine targeted biological weapons, optimized by machine learning, manufactured in a garage laboratory, and spread using an off-the-shelf quadrotor drone. Such a complex weapon cuts across existing institutional boundaries and jurisdictions.

Multilateral structures also assume that the main threats come from states. This is no longer valid, making traditional

state-focused governance mechanisms less relevant. Many of the technologies are used and produced by companies or individuals for commercial applications. Much of the necessary knowledge for developing technologies is available online.

Because of such challenges, we are ill equipped to answer big questions about technology governance and international security.

How does International humanitarian law apply to new technologies that become weaponized? When things go wrong with a new weapons system, does the legal and moral responsibility sit within the military chain of command or with the system's programmers? Where does accountability fall when technology reacts badly to a new situation, when data get corrupted, or when coding errors lead to human harm? The world lacks a commonly agreed on framework to navigate such grey areas.

Rethinking Technology Governance

There needs to be a new way of thinking about global norms when it comes to deployment of new technologies. There also is a need for a new, global platform to monitor, consider, and make recommendations addressing the implications of emerging technologies for international security. Such a platform would have three imperatives.

First, it would need to involve the private and public sectors. The purpose would be to enable and encourage greater transparency about the capabilities of new inventions with a “safety first imperative,” even when weaponization could not be further from an innovator’s mind.

Second, it would need to find ways to move beyond traditional, intergovernmental rule-making approaches in order to develop creative regulation of new technologies. This would require countries to fundamentally rethink nonproliferation and disarmament to emphasize practical measures that strengthen global, regional, and national norms. As technological progress democratizes the ability to inflict large-scale damage, time-honored tools to prevent escalation of disputes—treaties, conventions, international organizations, concepts of deterrence—are more important than ever but also increasingly difficult.

Third, it would need creative solutions for how to make any form of governance agile. Governance needs to include industry initiatives, laboratory standards, testing and certification regimes, and insurance policies. Legal and regulatory regimes are typically more slow moving by design and, though necessary to ensure compliance, also risk stifling progress if not seen as part of a wider and agile governance mechanism.

Involving More Stakeholders

International law limits the choice of weapons, means, and methods of warfare through its general rules and the conduct of hostilities but also through its specific treaty and customary rules, limiting and prohibiting the use of certain weapons that cause unacceptable harm. These standards and principles are as relevant as ever but must be applied during the conception phase of technology development. Trying to address risk post facto is no longer an option. It has to be in the early architecture of what we are developing and a key component of a preparedness strategy: security by design.

This will require more than institutional procedure reforms or merrily establishing a new venue for negotiations. It will



The Defense Advanced Research Projects Agency (DARPA)’s anti-submarine warfare continuous trail unmanned vessel (ACTUV) is a new class of unmanned ocean-going vessels able to travel thousands of miles over the open seas for months at a time, without a crew, and with a high degree of autonomy in operation. The ACTUV technology demonstrator was launched at its construction site in Portland, Oregon, on April 7, 2016.

require concerted effort to build trust, confidence, and greater understanding of what is at stake. It will require bringing in stakeholders from across the diplomatic, scientific, business, legal, and regulatory fields. It will require greater literacy at all levels, from decision makers to aspiring entrepreneurs, to ensure that innovation is accountable, responsible, and transparent.

A new approach to the oversight and governance of new technologies would map the interests of relevant stakeholders as well as existing efforts to develop a shared concept on mitigating the international security implications. It would identify champions in a spirit of collaboration. It would work to debunk myths and identify gaps or blind spots. It would build a repository of knowledge and practices. It would further public and policy literacy.

Above all, such an approach would recognize that humanity stands at an inflection point, with innovations outpacing evolution in norms, protocols, and governance mechanisms. And it would recognize that inclusive, agile, and anticipatory governance efforts can help avoid the potential harms of promising new technologies.

This article is adapted from remarks that Anja Kaspersen, senior adviser with the Hastings Center, delivered in November 2016 at the EU Non-Proliferation and Disarmament Conference in Brussels, Belgium.



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CONSIDER THIS...

Unplugged: Simple Summer



Fishing, tie-dying, and frisbee golf were just a few of the activities at this year's Investigation U.
(Photos by Francie Williamson and Stacy Emerich)



Since 2010, the Stanley Foundation has offered the Investigation U. day camp to middle-school students in Muscatine, Iowa. A major component of the camp is the opportunity for students to learn about cultures they may know little about. This year, students spent time interacting with visitors from Togo, Poland, and Costa Rica. Participants also enjoyed practicing tinikling, a game from the Philippines.

In keeping with the 2017 theme of "Unplugged," students experienced ways to connect with others and have fun without electronics. Several activities, such as miniature golf, fishing, enjoying 1950s playground equipment, a field trip to an organic dairy farm, and sharing a meal with an Amish family led participants to think about the positive aspects of a simpler lifestyle.