

Notes from the Edge

Insights into an Evolving Future

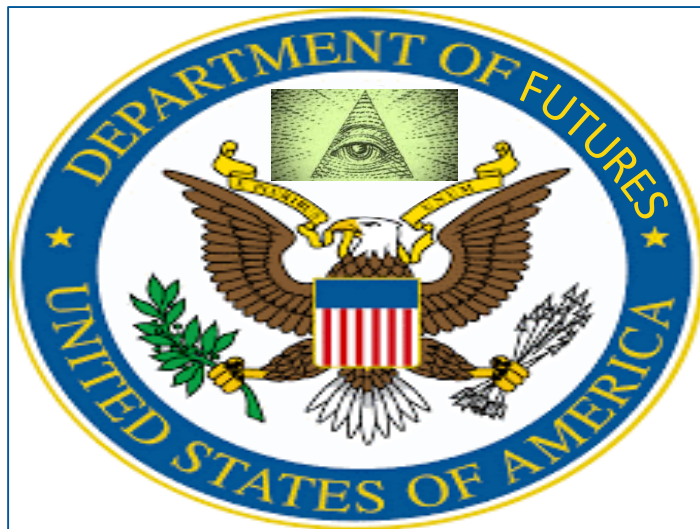


VOL 6 – ISSUE 4

APRIL 2016

A Product of the *Futures Assessment Division*

TABLE OF CONTENTS



Futuring and Politics.....	1
Resource Scarcity	1
Social	2
Technology	2
Energy.....	3
Marine Corps Security Environment Forecast	3
Art of Future Warfare Project.....	4

FUTURING AND POLITICS

What if we had a Secretary of the Future? In his last in-depth broadcast interview, the late writer and social critic Kurt Vonnegut observed, "I'll tell you...one thing that no Cabinet has ever had is a Secretary of the Future, and there are no plans at all for my grandchildren and my great grandchildren." Since then, his idea has bounced around the internet, never quite developing into a fully-fledged meme. We have a Secretary of Commerce, of Labor, of Defense. Why not a Secretary of the Future to help politicians think harder about how today's actions might play out in 10, 20, 50 years? If it sounds weird, it's not. Some big corporations — like Intel, Google, and Cisco — already have them.

[Mr./Madam Secretary](#)

RESOURCE SCARCITY

One crop breeding cycle from starvation. According to University of Illinois crop scientist Stephen P. Long "we're one crop breeding cycle away from starvation." In the race against world hunger, we're running out of time. By 2050, the global population will have grown and urbanized so much that we will need to produce 87 percent more of the four primary food crops - rice, wheat, soy, and maize - than we do today. At the same time, the climate is projected to change over the next 30 years, with warmer temperatures and more carbon dioxide (CO2) in the atmosphere. Crop plants can adapt to change through evolution, but at a much slower rate than the forecasted climate. Furthermore, the land available for growing crop plants is unlikely to expand to accommodate the predicted rise in demand. In fact, land suited to food crop production is being lost on a global scale.

[Running out of Food](#)

SOCIAL

Creating the Smart Cities of the Future. Governments are facing new challenges as urban populations continue to increase, further stressing infrastructures and resources. With over 30 urban areas housing more than 10 million people each, governments are being forced to implement new technologies to address current and future urbanization complications. One of the leading nations to address potential future challenges, Singapore has recently initiated the Virtual Singapore Project in which it will model the entire capital city of Singapore in 3D. The models seeks to identify, track, and store city data in an attempt to improve mobility, living conditions, governance, and overall sustainability. With an increase in city populations and activities, *The Atlantic* presents five deafening issues that should be addressed to mitigate noise-related health problems in growing urban centers.

Other cities around the world are also beginning to implement technological solutions to urbanization problems. Buenos Aires (which suffered flooding that claimed 101 lives in 2013), created a network of sensors that monitors the direction and speed of water flowing through the city. Ultimately, local governments are thinking about ways in which to support growing urban centers by develop smart cities.

Stae, a New York-based startup, is currently working on platforms to facilitate the interconnectedness between technologies (and their data), and city governments. Stae is developing a platform to collect data from companies such as Airbnb, Uber, and Google, to provide city planners and local governments with a detailed account of the city's efficiency and status.

[Smart Cities](#)

[Turn Down the Volume](#)

[Solving Urban Problems](#)

[Smarter Government](#)

New research unveils graphene 'moth eyes' to power future smart technologies. New research published in *Science Advances* has shown how graphene can be manipulated to create the most light-absorbent material for its weight, to date. This nanometer-thin material will enable future applications such as 'smart wallpaper' that could generate electricity from waste light or heat, and power a host of applications within the growing 'internet of things'. Using a technique known as nanotexturing, which involves growing graphene around a textured metallic surface, researchers from the University of Surrey's Advanced Technology Institute took inspiration from nature to create ultra-thin graphene sheets designed to more effectively capture light. [The Future of Power](#)

What will life look like in 100 years? Underwater cities, printed food and holidays to Mars. In this article the author has compiled a collection of striking images to show how the world population could all be living in 100 years' time. From owning an apartment in an underwater 'bubble city' to eating 3D-printed restaurant food and travelling in our own personal drones, futurists have predicted how technology will revolutionize life within a century. The *SmartThings Future Living Report* predicts that going on an exotic holiday in 2116 will not just mean heading as far afield as Australia or Thailand but leaving the Earth's atmosphere completely to spend a fortnight on the Moon or Mars. Additionally, people in this futuristic world are unlikely to suffer burn-out from work as the report predicts that we could all be working a three-day week as we attend meetings remotely via holograms. [Living in the Future](#)

TECHNOLOGY

Personal Transportation of the Future. To celebrate its 100th anniversary, BMW recently released its Vision Next 100 concept car which features technology the company thinks will be available in the next 100 years. The future vehicle has the ability to assist the driver by suggesting the ideal path and speed or to be self-driving. The entire windshield is an augmented reality display that can also be used for entertainment.

Goodyear is also thinking about the future and how it could remain relevant in the transportation world. Goodyear's Eagle-360 concept tire is the company's attempt at addressing possible future changes. The tire is a sphere connected to a driver-less car by magnetic levitation. The tires, having sensors that communicate road and weather conditions to the vehicle, maneuver in all directions.

MIT's Senseable City Lab has been researching how these and other changes in future vehicles will impact roadway infrastructures. The lab has developed "Light Traffic," a plan for intersections that is similar to slot-based management systems used in air traffic control. Driver-less cars use a wide array of sensors to navigate and cross intersections at precisely the right time. *Tech Crunch* discusses potential areas to consider when driver-less vehicles become standard, including car ownership and autonomous vehicle business and usage models.

[BMW's Future Car](#)

[The Wheels We Ride On](#)

[The Roads We Drive On](#)

[Who's Driving?](#)

Corrosion Resistant Drone can stay underwater for months and then launch for missions.

Researchers at the Johns Hopkins University Applied Physics Laboratory (APL), have developed an innovative unmanned aerial vehicle (UAV) that can stay on station beneath the water, then launch into the air to perform a variety of missions. The Corrosion Resistant Aerial Covert Unmanned Nautical System — or CRACUNS — is a submersible UAV that can be launched from a fixed position underwater, or from an unmanned underwater vehicle (UUV). A team from APL's Force Projection Sector worked with fabrication experts in the Research and Exploratory Development Department to create a new type of unmanned vehicle that can operate effectively in two very different arenas: air and water. [One if by Air, Two if by Sea](#)

ENERGY

Nuclear's share of primary energy to rise, says BP. While global energy demand is expected to grow by 34% between 2014 and 2035, nuclear power generation will grow 50% in total over the same period, according to the latest *Energy Outlook* from oil and gas giant BP. Fossil fuels will remain the dominant form of energy providing some 60% of the additional energy and accounting for almost 80% of total energy supplies in 2035, the study says. By 2035, non-fossil fuels will make up 21% of global primary energy compared with the current 14%. Among non-fossil fuels, renewables (including biofuels) are forecast to grow 6.6% per year, taking their share of primary energy from around 3% today to 9% by 2025. [Energy Delta](#)

China Unveils Vision of Greener Future in its Five-Year Plan. China's era of dark, satanic mills, churning out "stuff" for the rest of the world, is coming to a close. Instead, the world's second largest economy wants to accelerate its shift away from heavy, coal-hungry industry, towards a greener future. This will involve a big switch towards renewable energy and increasing consumption of produce domestically. That's the main message from the Chinese government's draft 13th five-year plan, unveiled in Beijing on 5 March (and adopted on 6 April). The "new normal" will involve a shift to moderate rather than dramatic economic growth, based more on consumption than exports.

[China Going Green](#)

MARINE CORPS SECURITY ENVIRONMENT FORECAST

The **2015 Marine Corps Security Environment Forecast: Futures 2030-2045** as announced in [MARADMIN 387/15](#) is open for public release and is available for download at the FAD website. Coming this summer FAD will publish a supplement to



the MCSEF. We look forward to bringing that to you.

Futures Assessment Division

ART OF FUTURE WARFARE PROJECT

The Atlantic Council's Art of Future Warfare Project seeks to cultivate a community of interest in works and ideas arising from the intersection of creativity and expectations about how emerging antagonists, disruptive technologies, and novel warfighting concepts may animate tomorrow's conflicts. Last month, The Project partnered with the FAD to host a Science Fiction Futures Workshop in Quantico, Virginia. Published authors Max Brooks, Charles E. Gannon, and August Cole, worked with 18 talented science fiction writers from across the services, with the goal of bringing to life the future worlds described in the 2015 MCSEF. Follow the hyperlink to Art of Future Warfare Project's website.



Art of Future Warfare

This newsletter is intended to highlight issues and ideas which may prove significant in the evolving future. In keeping with our focus on both alternative futures and analysis, items in this bulletin will generally be of an alternative nature, or drawn from atypical sources.