IBM UK Newsroom

IBM Expands Green Horizons Initiative Globally To Address Pressing Environmental and Pollution Challenges

- Programs to Benefit Citizens in Beijing, New Delhi, Johannesburg and Other Cities - Machine Learning and IoT Technologies Improve Accuracy of Environmental Forecasting

Beijing, China and Armonk, NY, USA - 09 Dec 2015: IBM Research (NYSE: IBM) today announced that it will expand its Green Horizons initiative globally to enable city governments, utility companies and factories to better understand and improve their relationships with the environment and to help tackle pressing issues related to air pollution and climate change.

Today's announcement builds on a successful year-long collaboration with the Beijing Environmental Protection Bureau (EPB), expanding to include over a dozen commercial deals and research engagements on four continents. IBM's China Research lab is working with the Beijing EPB to provide one of the world's most advanced air quality forecasting and decision support systems, able to generate high-resolution 1km-by-1km pollution forecasts 72 hours in advance and pollution trend predictions up to 10 days into the future. It models and predicts the effects of weather on the flow and dispersal of pollutants as well as the airborne chemical reactions between weather and pollutant particles. In the first three quarters of this year, the Beijing government was able to achieve a 20 percent reduction in ultra-fine Particulate Matter, bringing it closer to its goal of reducing PM 2.5 by 25 percent by 2017.

The new Green Horizons engagements apply IBM's advanced machine learning and Internet of Things (IoT) technologies to ingest and learn from vast amounts of Big Data, constantly self-configuring and improving in accuracy to create some of the world's most accurate energy and environmental forecasting systems. They include:

- An agreement with the Delhi Dialogue Commission to understand the correlation between traffic patterns and air pollution in India's capital and provide the government with 'what if' scenario modelling to support more informed decision-making for cleaner air.
- A pilot program with the City of Johannesburg and South Africa's Council of Scientific and Industrial Research to model air pollution trends and quantify the effectiveness of the city's intervention programs in support of Johannesburg's air quality targets and long-term sustainable development.
- Additional clean air projects in China with the Environmental Protection Bureau in Baoding (one of China's most polluted cities) to support the city's environmental transformation; the city of Zhangjiakou (host to the 2022 Winter Olympics) to improve air quality for the outdoor sporting event; and Xinjiang Province in north-west China.

In addition, the program is delivering on its promise to help increase contributions of wind, solar and other

renewable energy sources in to national grids. New customer engagements include:

- UK energy giant SSE is piloting IBM technology to help forecast power generation at its wind farms in Great Britain. The system is able to forecast energy for individual turbines and includes visualization tools to show expected performance several days ahead.
- In Japan, IBM is working with the Toyo Engineering Corporation and renewable energy company Setouchi Future Creations LLC on the Setouchi solar project – one of the largest in the country. IBM’s monitoring systems will help Setouchi manage and control energy from the plant's 890,000 solar panels.
- Through the United States Department of Energy’s SunShot initiative, IBM is making renewable energy forecasting technology available to government agencies, utilities and grid operators across the United States to support supply and demand planning.
- IBM is working with China's largest wind power solution provider - Xinjiang Goldwind Science & Technology Co., Ltd to use IoT, cloud computing, big data analytics and other advanced technologies to drive innovation and transform Goldwind's business and technological models. Also in China, Shenyang Keywind Renewable Company is using cognitive forecasting technologies to help integrate more energy into the grid.
- The Zhangbei Demonstration Project, managed by China’s State Grid Jibei Electricity Power Company, is tapping the power of Green Horizons renewable energy forecasting technology to integrate 10 percent more alternative energy into the national grid, enough to power more than 14,000 homes.

“Even as society is looking to address some of the biggest challenges of our generation -- environmental degradation and climate change -- two game-changing technologies have emerged that are completely transforming our understanding of the world in which we live,” said Arvind Krishna, senior vice president and director, IBM Research. “With Green Horizons, we are applying the most advanced cognitive computing and IoT technologies, combined with world-class analytics, to enable forward-looking government and business leaders in their efforts to make better decisions that can help safeguard the health of citizens today while helping to protect the long-term health of the planet.”

"Air pollution and climate change are global challenges that require stronger action by government and business," said Bob Perciasepe, president of the Center for Climate and Energy Solutions (C2ES). "To get to a clean energy future, we need accurate data about emissions, air quality and power generation. Advanced technologies can provide crucial insights about our impacts on the environment -- today and in the future."

New Initiatives Build on Success of IBM Clean Air Partnership in Beijing

IBM’s Green Horizons initiative is based on innovations from the company’s Research Laboratory in Beijing, with contributions from leading environmental experts across IBM’s global network of research labs. To help address the issue of air pollution -- considered to be the greatest environmental threat to human health -- IBM has developed next-generation pollution forecasting and management systems which draw on vast amounts of Big Data from environmental monitoring stations, weather stations, traffic cameras as well as meteorological and environmental satellites. Cognitive technologies understand this data, and use it to tune a predictive model that shows where the pollution is coming from, where it will likely go, and what will be its potential effect, allowing more informed decisions about how to improve air quality. Machine learning technologies ensure that the system automatically adjusts the predictive models to different seasons and topographies.

“In the past two decades China has been at the center of global manufacturing and economic growth,” said Dr.

Xiaowei Shen, Director, IBM Research - China. “However, this great progress has come at a cost and today the Chinese government has placed air pollution and climate change high on the national agenda. With Chinese investments into green innovation worth billions of dollars and with a new budding generation of environmental scientists coming to the fore, China is the natural starting point for IBM’s Green Horizons initiative which is now being exported to other parts of the world.”

To support China’s clean air action plan, IBM has entered a number of collaborations across the country. Building on their existing relationship, IBM and the Beijing Environmental Protection Bureau are launching a new Joint Environmental Innovation Center that will provide decision support capabilities to the Beijing government. Using scenario modelling, the government will be able to optimize its emission reduction strategy and achieve a balance between clean air and continued economic growth. Measures include short term limitations on urban traffic and construction activity as well as long term improvements to industrial production and power generation - such as switching to cleaner energy sources and installing filtering systems. The Beijing EPB also uses a colored alert system to warn citizens when harmful levels of pollution are forecast for the coming days. Selective, temporary reductions in industrial activity are also considered for large scale events such as the 2022 Winter Olympics.

“Our environmental engineers are working on a daily basis to tackle Beijing’s complex and challenging pollution problem and protect the health of citizens,” said Dawei Zhang, Director of Beijing’s Environmental Monitoring Center, a department of the BEPB. “Through our collaboration with IBM Research – China, we are delivering on our environmental commitments with the help of some of the most advanced technologies available. Over the past year we made good progress and the joint innovation with IBM is one of the key driving forces behind it.”

Building on these results, IBM is also working in the Chinese city of Baoding with the local Environmental Protection Bureau and environmental service provider Encanwell to improve the air quality in one of China’s most polluted cities. Pollution source tracking analyzes current emissions and prevailing weather patterns to identify the likely origin of pollution - a powerful tool for environmental law enforcement at industrial parks, factories and power stations.

“Our aim is to reduce PM2.5 by 33 percent over the next two years - IBM’s pollution analytics and forecasting technologies will help us to achieve this,” said Jimin Zhao, Lead Researcher at Baoding City Environmental Protection Bureau. "Using Green Horizons to track the source of pollution, we can take rapid, targeted action to reduce emissions. For example, we can require that heavily polluting enterprises install filtering systems, use smokeless fuels or we can even consider closing or relocating factories and power plants in the long term.”

About IBM Research

Now in its 70th year, IBM Research continues to define the future of information technology with more than 3,000 researchers in 12 labs located across six continents. Scientists from IBM Research have produced six Nobel Laureates, 10 U.S. National Medals of Technology, five U.S. National Medals of Science, six Turing Awards, 19 inductees in the National Academy of Sciences and 14 inductees into the U.S. National Inventors Hall of Fame – the most of any company.

For more information on IBM Research, please visit: www.research.ibm.com

For Green Horizon photos, please visit: https://www.flickr.com/photos/ibm_research_zurich/sets/72157644613083040

For Green Horizons B-roll, please visit: https://share.agencyroad.com/message/xuooqZcoZpNifmQJyf1hmP

For more info about the Green Horizons initiative and a film about the work in China, please visit: http://www.research.ibm.com/green-horizons/

For Green Horizons B-roll, please visit: http://ibm.newsmarket.com/Global/ibm/s/e865d5fa-67b8-4cd3-a991-469a2a4afd73

---

https://uk.newsroom.ibm.com/2015-Dec-09-IBM-Expands-Green-Horizons-Initiative-Globally-To-Address-Pressing-Environmental-and-Pollution-Challenges