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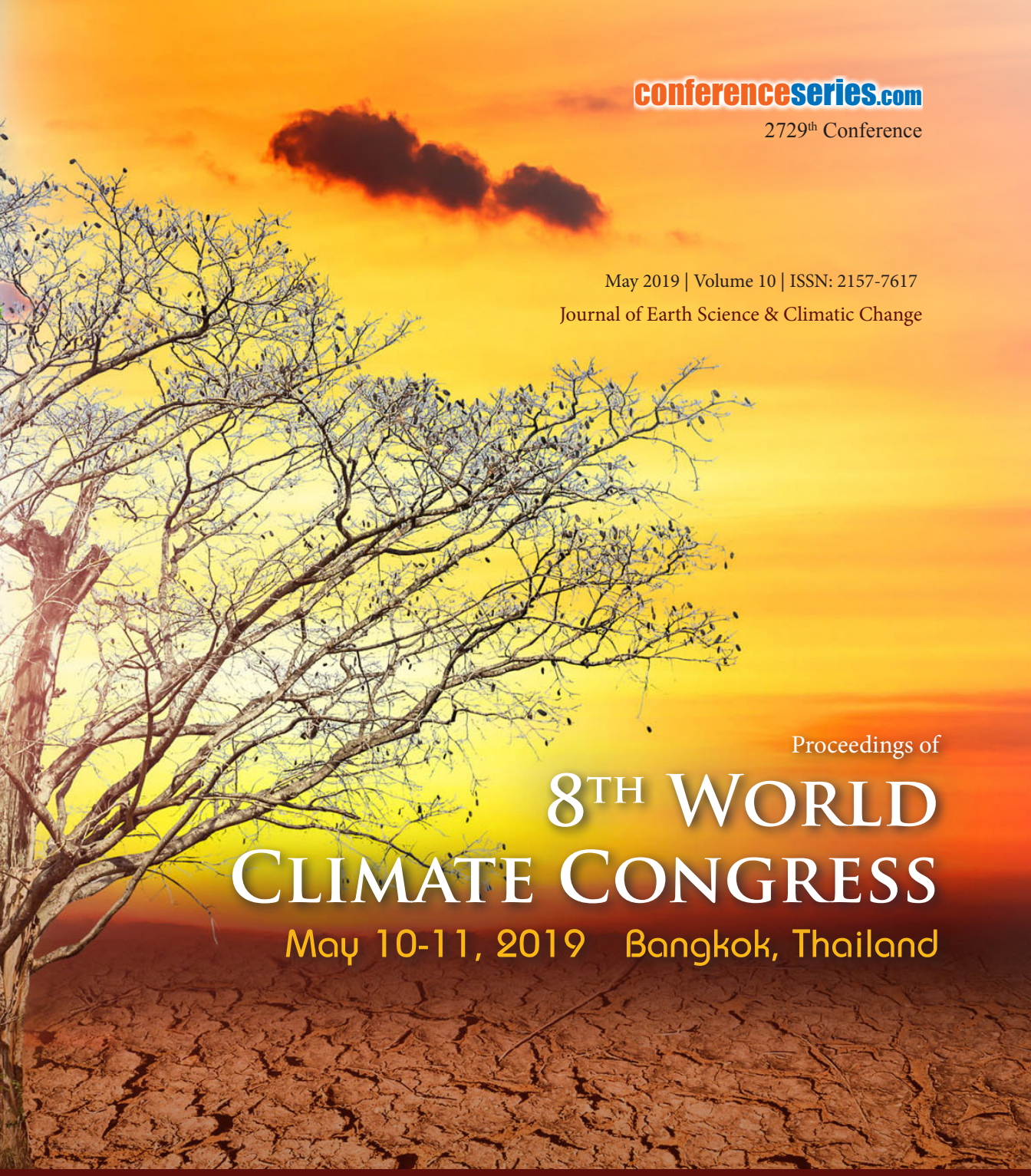

Proceedings of

# 8TH WORLD CLIMATE CONGRESS

May 10-11, 2019 Bangkok, Thailand

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# 8th World Climate Congress

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## Keynote Forum

### Day 1

James Robert Doyle, J Earth Sci Clim Change 2019, Volume 10
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*James Robert Doyle*
*Macalester College, USA*

## Grid storage consideration for high penetration of wind and solar power

Wind and solar energy are currently the most promising sources of grid electrical energy that can reduce carbon dioxide emission into the atmospheric. Although electric grid penetration of both wind and solar are rapidly increasing around the world, due to their unpredictable and intermittent nature energy storage will likely be needed in order to provide grid power balance. In this study we model the grid storage requirements for high penetrations of wind and solar power, examining the effects of combining wind and solar, drawing from a large geographical distribution of sources and over capacity. We also examine the effects of a small dispatchable balancing power on storage requirements. We use load data from the Midcontinent Independent System Operator (MISO) energy market that operates in the central region of the United States for the years 2007-2010 as a case study. Solar and wind production is modeled using results from the National Renewable Energy Laboratory Solar and Wind Integration Data Sets. Our results show for optimized solar to wind ratios large decreases in required energy storage capacity occur when the overcapacity is increased from 0 to 30%. Additional significant reductions in energy storage capacity occur when a small dispatachable balancing power is allowed. However, the corresponding storage and balancing power capacities are a significant fraction of the solar and wind capacities and have correspondingly low capacity factors.

### Biography

James Robert Doyle is a Physicist who currently studies models of the electrical grid when high penetrations of wind and solar are present. He also has spent most of his career studying materials for photovoltaic applications including hydrogenated amorphous silicon and germanium and zinc oxide. He has completed his PhD in Physics from the University of Colorado at Boulder in 1989 and Post-doctoral Research Associate at the University of Illinois and has worked as a Faculty at Macalester College, USA.

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Xiangrong Wang, J Earth Sci Clim Change 2019, Volume 10
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*Xiangrong Wang*
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## Ecological assessment on urban eco-security and strategy for the resilience to tackle with climate change

The concept of resilience under the challenges of global climate change has continuously attracted the international research interesting since 1980's. Some cities both in overseas and China such as London, New York, Chicago, Rotterdam, Durban, Quito, Shanghai, Shenzhen, Chengdu, Deyang and Huangshi, etc. have designed the planning and construction scheme of resilience according to their own characteristics from different aspects. It is now a new mode for urban development worldwide to tackle with the climate change. The dynamic resilience was assessed in this study by using a case study of Shanghai, China and puts forward the indexes system of eco-security and strategy of urban resilience. The results showed that the bigger difference exists between Chinese cities and western cities in environmental background and the complex ecosystem of natural and socio-economy, as well as administrative governance. Therefore, the strategies of China's urban eco-security and resilience should combine with their own conditions and characteristics.

### Biography

Xiangrong Wang is currently the Director and Professor of the Centre for Urban Eco-planning and Design in the Department of Environmental Science and Engineering and Deputy Director of Yangtze River Economic Zone of Fudan University in Shanghai, China. He also serves as the President of the Shanghai Ecological Society and the Deputy Chairman of the Urban Ecological Commission within the Ecological Society of China. In addition, he is a Member of the Shanghai Senate, a Member of Shanghai Municipal Science and Technology. He is the Commission, the Chair of Environmental Science and Greening Division of Shanghai's Municipal Construction Commission and Executive Member of IUCN-CEC. He currently focuses on his research in the areas of urban ecology and planning, climate change and urban ecosystem research, environmental policy and management, vegetation ecology and natural conservation and environmental assessment and planning.

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Tayfun Babadagli, J Earth Sci Clim Change 2019, Volume 10
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## Alternative recovery methods of heavy oil as an option to reduce greenhouse gas emission

Nearly 40% of energy consumption is met by oil (liquid hydrocarbons) in the world. Heavy oil/bitumen resources comprise more than 70% of the remaining oil reserves and their share in oil production is in increasing trend. These resources, however, require intensive steam injection to reduce the viscosity of oil, but steam generation is one of the contributors to carbon emission. For example, Canada is the 5th biggest producer of natural gas and 6% of this amount is consumed in heavy oil production. Based on the GHG emissions intensity of 68-77 kg for every barrel of oil produced via steam injection in Canada (mainly Alberta), the daily amount of GHG emissions is in the range of 91,300 to 103,400 tons. As such, reduction of steam use in heavy oil recovery is essential to mitigate greenhouse gas emission. This study summarizes the new approaches and methods (using chemical and solvent additives) to minimize the steam use in heavy oil recovery. Possible solutions to improve steam injection efficiency using chemical additives (surfactants, nanoparticles, nano solutions and ionic liquids) and even replacement to it by solvent injection and electrical methods for heating and optimization of these processes are outlined. Steam/solvent co-or alternate injection possibilities are also using laboratory and field scale numerical simulation trials as efficient methods also reducing the GHG emission. The GHG emissions of enhanced *in situ* bitumen recovery technique (e.g. Nano-based smart materials-solvent assisted SAGD) can be decreased by 20-70% comparison with the conventional one. In case of Alberta, Canada, the application of novel thermal/non-thermal *in situ* recovery technique can potentially reduce the GHG emission from 6.7 Mt to 23.5 Mt per year based on the current bitumen production. The core goal of this research is to decrease such an environmental footprint (including GHG emissions and water/natural gas consumption) and sustain a stable oil production at a comparable level of the conventional *in situ* heavy oil and bitumen recovery technique.

### Biography

Tayfun Babadagli is working as a Professor in Civil and Environmental Engineering Department, School of Mining and Petroleum Engineering at the University of Alberta, where he holds an NSERC-Industrial Research Chair in Unconventional Oil Recovery. He has worked as Faculty at Istanbul Technical University, Turkey and Sultan Qaboos University, Oman. His areas of interest includes modeling fluid and heat flow in heterogeneous and fractured reservoirs, reservoir characterization through stochastic and fractal methods, optimization of oil/heavy oil recovery by conventional/unconventional enhanced oil recovery methods and CO2 sequestration. He has completed his Bachelor's and Master's degree from Istanbul Technical University and MS and PhD degrees from the University of Southern California, all in Petroleum Engineering. He was an Executive Editor for *SPE Reservoir Evaluation and Engineering* (Formation Evaluation part) between 2010 and 2013 and an Associate Editor of ASME *Journal of Energy Resources Technology* between 2011 and 2014. He is currently a Member of the JPT Editorial Committee. He has received SPE's A Peer Apart Award in 2013, elected as an SPE Distinguished Member in 2013 and was an SPE Distinguished Lecturer from 2013-2014. He is also the recipient of the 2017 SPE International Reservoir Description and Dynamics Award.

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Sanjay K Srivastava, J Earth Sci Clim Change 2019, Volume 10
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## Sanjay K Srivastava

*United Nations Economic and Social Commission for Asia and the Pacific, Thailand*

# Building climate resilience in Asia and the Pacific: Emerging technologies, the game changers

The Asia-Pacific region continues to be hit by complex climate related disasters often with cascading impacts on communities that transcend national boundaries. A rapid sequence of disasters outpaces the resilience of people – relentlessly eroding development gains by aggravating poverty, intensifying environmental degradation, disempowering vulnerable groups and widening inequalities. Indeed, three years into the implementation period of the 2030 Agenda the region seems to be moving in the wrong direction on inequality and environmental degradation. The proposed presentation will anchor how emerging technologies enables a paradigm shift from resilience-building to inclusion, and empowerment of communities who are at ever higher risk of disasters. Building on IPCC's 2018 Special Report on the criticality of a no more than 1.5 degree increase in the planet's temperature, the report highlights how the increased likelihood of extreme climatic events may enhance the exposure and vulnerability of the poor further. The presentation will highlight the link between new technologies and people empowerment. Governments need evidence-based risk information on marginalized and vulnerable people to inform regional, national, and sub-national policies that promote inclusion and empowerment. These are increasingly being informed by advances in big data analytics, artificial intelligence and the internet of things – all of which can transform the ways in which disaster risk information, for example, is gathered, analyzed, and communicated. Further, the presentation will highlight advances in data science, and new technologies in disaster risk reduction that feed into evidence-based planning and policy interventions to address the unmet needs of inclusion, empowerment and resilience. For example, more and better risk data are being captured by using machine learning for image recognition. High-resolution satellite and drone imagery are now available to inform risk diagnostics comprehensively and in real time. A machine learning algorithm can use these images to identify more reliable visual indicators of risk or resilience.

## Biography

Sanjay K Srivastava, Ph D (Applied Physics), is presently Chief of Disaster Risk Reduction at UN Economic and Social Commission for Asia and the Pacific (ESCAP). He was ESCAP Regional Adviser on Disaster Risk Reduction from Oct 2009 to June 2014; Head of SAAARC Disaster Management Centre – New Delhi from 2007-2008; Deputy Project Director of Disaster Management Support Programme at Indian Space Research Organisation (ISRO); Scientist/Engineer at ISRO HQ Bangalore since 1991. He is the recipient of ISRO's Team excellence award in 2008-09 for his contributions towards harnessing space technology applications for the benefits of rural poor. While he has more than 100 publications on disaster risk reduction, including research papers in peer reviewed international journals, intergovernmental reports and books; Sanjay has been a lead author of ESCAP's flagship publication – Asia-Pacific Disaster Report.

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