

As of Oct 2023

## Professor Shobhakar Dhakal

Professor of energy, environment, and climate change  
Asian Institute of Technology (AIT), Thailand

*(Former Vice President for Academic Affairs)*

*(Former Dean of School of Environment, Resources and Development)*

[shobhakar@ait.ac.th](mailto:shobhakar@ait.ac.th), [shobhakar.dhakal@gmail.com](mailto:shobhakar.dhakal@gmail.com)

More here: <http://faculty.ait.asia/shobhakar>



Prof. Dhakal works in the interface of research-policy-practice aiming for ‘impact’ and enabling ‘evidence-based policy making’. Prof. Dhakal’s teaching, research and international activities comprise in the areas of energy and climate policies, accounting of energy and GHG emissions, modeling of policy options and scenarios for energy and climate change mitigation, cities and climate change, climate finance and carbon markets, and the SDG (Sustainable Development Goals) synergies and tradeoffs of climate and energy goals.

Prof. Dhakal was the Vice President (Academic Affairs) of AIT from April 2021 to August 2023 and was responsible for Institute’s entire academic and research portfolios which was comprised of three Schools, over 40 academic degree programs, about 140 regular/visiting/adjunct faculty members, over 300 staffs, annual sponsored researcher portfolio of about 350 projects and 50 mn US\$ (new annually initiated projects were around 120 with value of about 15-20 mn US\$), and about 400 publications in SCOPUS indexed journals annually. He was also the Dean of the School of Environment, Resources and Development (July 2020 - March 2021) and Head of the Department of Energy, Environment and Climate Change (January 2017-Dec 2018).

Prof. Dhakal was a candidate (nominated by the Government of Nepal) for [election](#) of Co-Chair of Working Group III in the 7<sup>th</sup> assessment cycle for the Intergovernmental Panel on Climate Change (IPCC). He has served as a [Coordinating Lead Author](#) for the [6<sup>th</sup> Assessment Report \(WGIII-Mitigation\)](#) of IPCC, where he led assessment on [Emission Trends and Drivers](#) (Chapter 2). Prof. Dhakal is also a [member](#) of Scientific Steering Committee of the [Global Carbon Project](#) (a well-known global research program). As a Coordinating Lead Author, he also led 5<sup>th</sup> Assessment Report of IPCC (WGIII-mitigation) for the [Chapter 12, Human Settlements, Infrastructure and Spatial Planning](#).

Prof. Dhakal was placed amongst the top 1% of the global researchers each year for last several years (2020, [2021](#), [2022](#), [2023](#)) in the field of Energy as published in [PLOS Biology Journal](#) by Stanford researchers. He was also amongst the 20 co-authors of UN-led high-level global scientific assessment launched on 18 February 2021 by UN Secretary-General António Guterres “[Making Peace with Nature: a scientific blueprint to tackle the climate, biodiversity and pollution emergencies](#)” that outlines a blueprint to tackle Earth’s interconnected planetary crises presenting the latest science. His key contributions are also in major recent global scientific processes related to energy, climate change mitigation, and the cities and climate change issues. Prof. Dhakal had led [energy assessment for the Hindu Kush Himalaya](#), which is one of its first kind of assessment for the region led by the International Center for Integrated Mountain Development (ICIMOD). He also served as an International Expert Panel Member of the Consensus Panel on Low Carbon Cities at the Academy of Science of South Africa (ASSF) in 2009-2011. He was involved in



publishing 336 cities' emissions data and key drivers for the global community which is published by Nature's Scientific Data in October 2018. His paper on urban typology and emissions in 50 Japanese cities, published in Urban Climate in 2012 was one of the most cited paper till 2017 of the Journal. He was one of the first group of scholars to carry out meta-analysis of the emissions of global cities (done on requests from the World Bank in 2009) which are taken as a base by many follow-on researchers. He has special focus on China's cities and climate change issues where he has published many papers closely working with researchers in China. Prof. Dhakal was part of International Energy Agency's World Energy Outlook 2008 team that made the first global estimation on the role of cities in the global energy consumption and carbon emissions -he led Asia and China there.

He has published papers in the top journals in the field such as Nature, Nature Sustainability Nature Climate Change, Nature Scientific Data, Energy, Energy Policy, Journal of Industrial Ecology, Current Opinion in Environmental Sustainability, and others. He has published 8 books, two dozen book chapters, and over 80 peer-reviewed papers in international journals. Prof. Dhakal has delivered keynote and took plenary speaking roles in major international scientific conferences such as [Planet Under Pressure](#) (London, 26-29 March 2012), Chatham House event (London, 27-28 May 2014), [Our Common Future Under Climate Change](#) (Paris, 7-10 July 2015), [Vienna Energy Forum](#) (Vienna, 10-12 May 2017), [Cities & Climate Change Science Conference](#) (Edmonton, 5-7 March, 2018), [International Conference on Sustainable Built Environment and Urban Transition](#) (Linnaeus University Sweden, 12-13 October 2023). He was invited to co-chair the Scientific Steering Committee of this Edmonton Conference in 2018, which aimed to set a global research agenda for the future. The [Global Research and Action Agenda](#) that Prof. Dhakal helped to develop and personally co-authored with many experts is now noted by IPCC and now being implemented by the related international communities.

He has delivered over 100 keynotes/plenary talks/invited talks in various events globally since 2012. Prof. Dhakal is equally active in non-peer-reviewed policy-oriented publications and closely communicates with journalists for science communication. He is quoted in the Economist, Reuters and many other media including several television interviews. He is closely engaged with UN, other multilateral agencies and development Banks, foundations, government agencies and broader stakeholders.

Before joining Asian Institute of technology, Prof. Dhakal, was one of the two Executive Directors of the [Global Carbon Project](#) from 2006-2012. He was a Guest Scholar to the Transition to New Technologies Group of [International Institute for Applied Systems Analysis, Austria](#) (2010-2013), a visiting Associate Professor to [Nagoya University](#) (2009-2012), and a visiting researcher (2012-2017) to [National Institute for Environmental Studies, Japan](#). He was a Senior Policy Researcher and Project Manager of urban program at the [Institute for Global Environment Strategies](#), Japan in 2000-2006.



## Professor Shobhakar Dhakal

Date of Birth: 1970 December 10  
Nationality: Nepali  
Sex: Male  
Personal website: <https://faculty.ait.ac.th/shobhakar/>  
Twitter: <https://twitter.com/ShobhakarAIT>  
LinkedIn: <https://www.linkedin.com/in/shobhakar-dhakal-1481aaa/>

### Key experiences

Feb 2019 – ongoing	Professor of Energy and Climate Policy, Department of Energy, Environment and Climate Change, School of Environment, Resources and Development, Asian Institute of Technology (AIT), Thailand.
April 2021 – Aug 2023	Vice President (Academic Affairs), Asian Institute of Technology (AIT), Thailand
July 2020 – March 2021	Dean, School of Environment, Resources and Development, Asian Institute of Technology (AIT), Thailand
Jan 2017 – Dec 2018	Head, Department of Energy, Environment and Climate Change, Asian Institute of Technology (AIT), Thailand.
July 2012 – Jan 2019	Associate Professor of Energy and Climate Policy, Energy Field of Study, School of Environment, Resources and Development, Asian Institute of Technology (AIT), Thailand.
April 2006 – July 2012	Co-Executive Director (based in Japan), Secretariat of the Global Carbon Project, Hosted at National Institute for Environmental Studies, Japan and the Commonwealth Scientific and Research Organization (CSIRO), Australia.
April 2001 - March 2006	Researcher/Policy Researcher/Senior Policy Researcher and Project Manager, Urban Environmental Management Project, Institute for Global Environmental Strategies (IGES), Japan. ( <a href="http://www.iges.or.jp/en/">http://www.iges.or.jp/en/</a> )

### Affiliated positions

Aug 2012 – March 2016	Visiting Researcher, Center for Global Environmental Research, National Institute for Environmental Studies, Japan.
Nov 2009 – Oct 2013	Guest Research Scholar, Transitions to New Technology Program, International Institute for Applied Systems Analysis (IIASA), Austria.
April 2008 - March 2013	Visiting Associate Professor, Graduate School of Environmental Studies, Nagoya University, Japan.
Nov 2011 – March 2013	Senior Fellow, Institute for Global Environmental Strategies, Japan.

### Academic credentials

- Doctor of Philosophy (Ph. D), Department of Urban Engineering, The University of Tokyo, Japan, 2000 (Energy Management and Mitigation of Urban Heat Island).
- Special Full Time Graduate Student, January-May Semester, Technology Policy and Planning Program and Department of Civil Engineering, Massachusetts Institute of Technology, United States, 1999.



- Master of Engineering in Energy Policy and Planning, Asian Institute of Technology, Thailand, 1996.
- Bachelor of Engineering, Electrical Power System, SV Regional College of Engineering and Technology, South Gujarat University, India, 1993.

**Key leadership in knowledge community (selected recent activities only)**

- *Coordinating Lead Author*, Emission Trends and Drivers (Chapter 2), IPCC's Sixth Assessment Report (WGIII-Mitigation), 2018- 2023
- *Coordinating Lead Author*, Chapter on Human Settlements, Infrastructure and Spatial Planning, IPCC's Fifth Assessment Report (WGIII-Mitigation), 2010- 2014
- Member of Scientific Steering Committee, Global Carbon Project (Future Earth's Core Project- [www.globalcarbonproject.org](http://www.globalcarbonproject.org)), 2014 ~ ongoing
- *Co-Chair of Science Steering Committee*, IPCC's Cities and Climate Change Science International Conference, 5-7 March 2018, Edmonton, Canada, <http://www.citiesipcc.org>.
- Co-Editor, Second International Assessment on Climate Change in Cities (ARC-2), Urban Climate Change Research Network ([www.uccrn.org](http://www.uccrn.org)), 2012- 2018.
- Member of Global Management Team, Urban Climate Change Research Network, Earth Institute, Columbia University ([www.uccrn.org](http://www.uccrn.org)), 2012-2018
- Coordinating Lead Author for regional energy assessment in Hindu Kush Himalaya titled "[Meeting Future Energy Needs in the Hindu Kush Himalaya](#)", Hindu Kush Himalayan Monitoring and Assessment Programme (HIMAP), Coordinated by International Center for Integrated Mountain Development (ICIMOD) 2015-2018.
- Member of Thematic Group (Network 9) on 'Sustainable Cities' of Sustainable Development Solution Network (SDSN): A Global Initiative for the United Nations 2013- 2015.
- Member of Program Committee of Climate and Cities Conference 2017, September 19th- 21st, 2017, Potsdam Institute for Climate Impact Research (PIK), Potsdam, Germany, <http://www.ramses-cities.eu/>
- Principal Scientific Reviewer (PSR) of Global Environmental Outlook 5 (GEO-5). United Nations Environmental Program (UNEP), 2011.
- Lead Author, Urban Energy Systems, Global Energy Assessment- [http://www.iiasa.ac.at/Research/ENE/GEA/index\\_gea.html](http://www.iiasa.ac.at/Research/ENE/GEA/index_gea.html), 2008 ~ 2011.

**Graduate Students supervised for research on energy, climate change and urban issue**

- Master research students: 50 completed
- Doctoral students: 5 completed (ongoing 5)
  - Completed
    1. Economic and Environmental Impacts of Promoting Biofuel in Thailand in the Contract of ASEAN Economic Community
    2. Climate Change Policy Analysis in Southeast Asian Countries: A Dynamic General Equilibrium Approach
    3. Energy and Infrastructure Costs Associated with Urban Typology in Thailand
    4. Implications of Household Consumption to Energy Requirements and CO2 emissions in Thailand: Micro and Macro Perspectives



5. Characteristics of Urban Heat Island, Local Climate Zone Classification and Strategies for Bangkok

**Graduate courses delivered**

1. Environmental Policy and Management of Energy Systems
2. Energy, Environment and Climate Change: Issues & Strategies
3. Energy Economy Modelling and Policy Analyses
4. Carbon Markets and Carbon Finance
5. Development and Evaluation of Energy Projects
6. Economics of Climate Change
7. Climate Change Challenges and Responses
8. Energy Systems, Economics and Policy
9. Resources Use and Efficiency

**Publications**

*(A total of 16 policy related non-academic publications including policy briefs; 6 development project related reports, 80 peer-reviewed journal papers, 10 books incl edited books, and 22 book chapters)*

**Books**

1. Review of Developments in Transport in Asia and the Pacific 2021, Madan B. Regmi, Dorina Pojani, Tim Schwanen, **Shobhakar Dhakal**, and Junyi Zhang. December 2021, UNESCAP, Bangkok ISBN: 9789211208337. <https://www.unescap.org/kp/2021/review-developments-transport-asia-and-pacific-2021>
2. United Nations Environment Programme (2021). Making Peace with Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies. Nairobi. <https://www.unep.org/resources/making-peace-nature>. I am one of the 20 co-authors of this 1-year long process of high-level Global Scientific Assessment Report released by UN Secretary General and UNEP Executive Director on 18 February 2021.
3. World Climate Research Programme (2019). *Global Research and Action Agenda on Cities and Climate Change Science*. Prieur-Richard, A.H., B. Walsh, M. Craig, M.L. Melamed, M. Colbert, M. Pathak, S. Connors, X. Bai, A. Barau, H. Bulkeley, H. Cleugh, M. Cohen, S. Colenbrander, D. Dodman, **S. Dhakal**, R. Dawson, J. Espey, J. Greenwalt, P. Kurian, B. Lee, L. Leonardsen, V. Masson-Delmotte, D. Munshi, A. Okem, G.C. Delgado Ramos, R. Sanchez Rodriguez, D. Roberts, C. Rosenzweig, S. Schultz, K. Seto, W. Solecki, M. van Staden, and D. Ürge-Vorsatz (Eds.). 31 pp. WCRP Publication No. 13/2019. Available at: <https://www.wcrp-climate.org/WCRP-publications/2019/GRAA-Cities-and-Climate-Change-Science-Full.pdf>.
4. Rosenzweig C., W. Solecki, P. Romero-Lankao, S. Mehrotra, **S. Dhakal**, and S. Ali Ibrahim (Ed.) (2018). *Climate Change and Cities- Second Assessment Report of the Urban Climate Change Research Network*, Cambridge University Press, Cambridge, UK.  
<http://www.cambridge.org/gb/academic/subjects/earth-and-environmental-science/climatology-and-climate-change/climate-change-and-cities-second-assessment-report-urban-climate-change-research-network>



5. **Dhakal S.** and M. Ruth (Ed.) (2017). *Creating Low Carbon Cities*, Springer. <https://link.springer.com/book/10.1007%2F978-3-319-49730-3>
6. Rosenzweig C., W. Solecki, P. Romero-Lankao, S. Mehrotra, **S. Dhakal**, T. Bowman, and S. Ali Ibrahim (2015). *ARC3.2 Summary for City Leaders*. Urban Climate Change Research Network. Columbia University. New York. <http://uccrn.org/arc3-2/>
7. Zusman E., A. Srinivasan, and **S. Dhakal** eds. (2011). *Low Carbon Transport in Asia: Strategies for Optimizing Co-benefits*, London and New York: Routleg. <https://www.routledge.com/Low-Carbon-Transport-in-Asia-Strategies-for-Optimizing-Co-benefits/Zusman-Srinivasan-Dhakal/p/book/9781844079155>
8. Coulter L., P Canadell and **S. Dhakal** (2008). Carbon Reductions and Offsets, *GCP Report No.6*, Canberra: Global Carbon Project.
9. **Dhakal. S** (2006). *Urban Transportation and the Environment in Kathmandu Valley, Nepal: Integrating Global Carbon Concerns into Local Air Pollution Management*. Hayama, Japan: Institute for Global Environmental Strategies.
10. **Dhakal, S.** (2004). *Urban Energy Use and Greenhouse Gas Emissions in Asian Mega-cities: Policies for a Sustainable Future*, Hayama, Japan: Institute for Global Environmental strategies.

#### Book chapters

1. **Dhakal S.** and S. Shrestha (2021). Clean Energy Finance in the Countries of the Association of Southeast Asian Nations (ASEAN). In: Susantono, B., Y. Zhai, R.M. Shrestha, and L. Mo (eds) *Financing Clean Energy in Developing Asia*, Asian Development Bank. Manila. <https://www.adb.org/publications/financing-clean-energy-developing-asia>
2. **Dhakal S.** et al. (2019). Meeting Future Energy Needs in the Hindu Kush Himalaya. In: Wester P., Mishra A., Mukherji A., Shrestha A. (eds) *The Hindu Kush Himalaya Assessment*. Springer. [https://doi.org/10.1007/978-3-319-92288-1\\_6](https://doi.org/10.1007/978-3-319-92288-1_6) (51,000 downloads as of October 2022)
3. Rosenzweig, C., W. Solecki, P. Romero-Lankao, S. Mehrotra, **S. Dhakal**, and S. Ali Ibrahim (2018). Pathways to urban transformation. In: *Climate Change and Cities: Second Assessment Report of the Urban Climate Change Research Network* (C. Rosenzweig, W. Solecki, P. Romero-Lankao, S. Mehrotra, S. Dhakal, and S. Ali Ibrahim (eds.)). Cambridge University Press, Cambridge, UK and New York, NY, USA. <https://doi.org/10.1017/9781316563878.007>
4. **Dhakal S.**, and A. Shrestha (2017). Optimizing Water-Energy-Carbon Nexus in Cities for Low Carbon Development, In *Low Carbon Cities* (Ed. Shobhakar Dhakal and Matthias Ruth), Springer, UK. [https://doi.org/10.1007/978-3-319-49730-3\\_4](https://doi.org/10.1007/978-3-319-49730-3_4) (750 downloads as of August 2019).
5. **Dhakal S.** and A. Shrestha (2016). Bangkok, In *Cities on a Finite Planet- Towards transformative responses to climate change* (Ed. Sheridan Bartlett, David Satterthwaite), Routledge, London and New York.
6. Bai X., **S. Dhakal**, J. Steinberger, and H. Weisz (2012). Drivers of urban energy use and main policy leverages. *Energizing Sustainable Cities: Assessing Urban Energy* (Ed. Arnulf Grubler and David Fisk), Routleg, London and New York.



7. **Dhakal S.** (2012). Urban air quality management. *Energizing Sustainable Cities: Assessing Urban Energy* (Ed. Arnulf Grubler and David Fisk), Routleg, London and New York, 2012.
8. Zusman E., A Srinivasan, and **S. Dhakal** (2011). Low Carbon Transport and co-benefits in Asia: An Overview. In *Low Carbon Transport in Asia: Strategies for Optimizing Co-benefits* (Ed. Eric Zusman, Ancha Srinivasan, and Shobhakar Dhakal). London and New York: Routleg. pp 3-18.
9. Zusman E., A. Srinivasan, and **S. Dhakal** (2011). Low Carbon Transport and co-benefits in Asia: the way forward. In *Low Carbon Transport in Asia: Strategies for Optimizing Co-benefits* (Ed. Eric Zusman, Ancha Srinivasan, and Shobhakar Dhakal). London and New York: Routleg. pp 244-259.
10. Grubler, A., X. Bai, T. Buettner, **S. Dhakal**, D.J. Fisk, T. Ichinose, J. Keirstead, G. Sammer, D. Satterthwaite, N.B. Schulz, N. Shah, J. Steinberger and H. Weisz (2011). Urban Energy Systems. In *Global Energy Assessment: Toward a Sustainable Future*. L. Gomez-Echeverri, T.B. Johansson, N. Nakicenovic, A. Patwardhan, (eds.), IIASA, Laxenburg, Austria and Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
11. Kennedy C., A. Ramaswami, S. Carney and **S. Dhakal** (2011). Greenhouse Gas Emission Baselines for Global Cities and Metropolitan Regions, *Cities and Climate Change: Responding to an Urgent Agenda*, Daniel Hoornweg, Mila Freire, Marcus J. Lee, Perinaz Bhada-Tata, and Belinda Yuen, Eds., The World Bank, Washington DC, USA, 15-54.
12. Hammer, S. A., J. Keirstead, **S. Dhakal**, J. Mitchell, M. Colley, R. Connell, R. Gonzalez, M. Herve-Mignucci, L. Parshall, N. Schulz, M. Hyams, (2011). Climate change and urban energy systems. *Climate Change and Cities: First Assessment Report of the Urban Climate Change Research Network*, C. Rosenzweig, W. D. Solecki, S. A. Hammer, S. Mehrotra, Eds., Cambridge University Press, Cambridge, UK, 83–109.
13. **Dhakal, S.** (2010). Urban energy transitions in Chinese cities. In *Cities and Low Carbon Transition* (ed. Harriet Bulkeley, Vanesa Castán Broto, Mike Hodson and Simon Marvin), London: Routledge.
14. Roy, J., C. Bose, R. Bose, S. Das, **S. Dhakal**, M. Dasgupta, R. Ghate, S. S. Roy, M. Konar, A. Aickramasinghe, M. Roy and C. Chaudhuri (2010). Development Pathways. In *Global Environmental Changes in South Asia: A Regional Perspective* (ed A.P Mitra and C. Sharma). Capital Publishing Company, New Delhi Kolkata.
15. Contributions to CCICED Policy Research Report 2009. *Energy efficiency and urban development*. Policy recommendations to Chinese Government from Taskforce on Urban Development and Energy Efficiency of China Council for International Cooperation on Environment and Development (CCICED) <http://cciced.net/enciced/media/publication/PubProcessofAGM/2009agmpp/tfreports/200911/P020091130360386085315.pdf>
16. Jollands N., P. Dowling, **S. Dhakal**, L. Guimaraes, S. Hammer, S. Henihan, L. Parshall, M. Ruth, N. Shulz, W. Wescott. 2008. Chapter 8- Energy Use in Cities, *World Energy Outlook 2008*, Paris: International Energy Agency.
17. **Dhakal, S.** (2008). Climate Change and Cities: The Making of a Climate Friendly Future, *Urban Energy Transition* (ed. Peter Droege), Oxford: Elsevier.



18. **Dhakal, S.** (2005). De-coupling of Urban Mobility Need from Environmental Degradation in Singapore. *Urban Infrastructure - An Introduction* (ed Y. Chandra Sekhar), Hyderabad: ICFAI University Press, pp 198-226.
19. **Dhakal, S.** (2005). Strengthening urban environmental management in Asia, *Sustainable Asia 2005 and Beyond – In pursuit of innovative policies*, Hayama, Japan: Institute for Global Environmental Strategies.
20. **Dhakal, S.** (2005). Energy consumption and GHG emission in Asian mega-cities. *Urban Environmental Management Challenges in Asia*, Hayama, Japan: Institute for Global Environmental Strategies.
21. **Dhakal, S.** (2003). The Urban Heat Environment and Urban Sustainability. *Future Cities: Dynamics and Sustainability* (Ed. Fred Moavenzadeh, Keisuke Hanaki and Peter Baccini), pp 149-172, Kluwer Academic Publishers.
22. Scoping Report on Urbanisation and Global Environmental Change, International Human Dimensions Program (IHDP), Bonn, February 2003, Germany (Edited by Roberto Sanchez).

#### **Peer-reviewed journal publication**

1. Battulga, S. and **S. Dhakal** (2023). Stakeholders' perceptions of sustainable energy transition pathways in the city of Ulaanbaatar, Mongolia. Accepted for publication to *Renewable and Sustainable Energy Reviews*, Elsevier.
2. Champeecharoensuk, A., **S. Dhakal** and N. Chollacoop (2023). Climate Change Mitigation in Thailand's Domestic Aviation: mitigation options analysis towards 2050, *Energies*, 16(20), 7199, MDPI. <https://doi.org/10.3390/en16207199>
3. Aryal, S., **S. Dhakal** and S. KC. (2023). Integrated Analysis of End-use Electrification and Cross-border Electricity Trade Policies for Hydropower Enabled Energy Transformation in Nepal, *Renewable Energy* Vol 219, Part 1 (Dec 2023) 119467, Elsevier. <https://doi.org/10.1016/j.renene.2023.119467>
4. Stringer, L.C, **S. Dhakal**, M. Milkoreit, C. Mendoza, A. Mukherji, I. Shishlov, S. Fisher, N. P. Simpson, C. F. Schleussner (2023). Ratcheting up effectiveness to improve the Global Stocktake process. *One Earth* 6 (9), 1069-1073. Cell Press. <https://doi.org/10.1016/j.oneear.2023.08.018>
5. Gamonwet, P. and **S. Dhakal** (2023). The Assessment of the value of electricity saving and economic benefit to residential solar rooftop PV customers: The Case of Thailand. *Energy Strategy Reviews* 50 (2023) 101203 Elsevier. <https://doi.org/10.1016/j.esr.2023.101203>
6. Kamandika, F. A, and **S. Dhakal** (2023). Impact of Carbon Price on Indonesia's Power Sector Up To 2050. *Carbon Neutrality*, Springer. <https://doi.org/10.1007/s43979-023-00066-4>
7. Battulga, S. and **S. Dhakal** (2023). Energy Demand Modeling for the Transition of a Coal-Dependent City to a Low-Carbon City: The Case of Ulaanbaatar City. *Energies* 2023, 16, 6291. MDPI. <https://doi.org/10.3390/en16176291>
8. **Dhakal, S.** and M. Pradhan (2023). Identification and prioritization of barriers to access international climate finance for Nepal. *Asia-Pacific Sustainable Development Journal*, 30 (1) 121-146, May 2023. United Nations Economic and Social Commission for Asia and the Pacific. Bangkok.



- <https://www.unescap.org/kp/2023/asia-pacific-sustainable-development-journal-vol-30-no-1-may-2023>.
9. Chen, S., K Fang, **S. Dhakal**, A. Kharrazi, KK, Tong and A. Ramaswami (2023). Advancing urban infrastructure research for a carbon-neutral and sustainable future. *Resources, Conservation & Recycling*, 197:107049, Elsevier. <https://doi.org/10.1016/j.resconrec.2023.107049>
  10. Thapa, P., B Mainali, **S. Dhakal** (2023). Focus on Climate Action: What level of synergy and trade-off is there between SDG 13; Climate action and other SDGs in Nepal? *Energies*, 16(1) 566, MDPI. <https://doi.org/10.3390/en16010566>
  11. Babiker, M., Bazaz, A., Bertoldi, P., Creutzig, F., De Coninck, H., De Kleijne, K., **Dhakal, S.**, Halder, S., Jiang, K., Kılış, Ş., Klaus, I., Krishnaswamy, J., Lwasa, S., Niamir, L., Pathak, M., Pereira, J. P., Revi, A., Roy, J., Seto, K.C., Singh, C., Some, S., Steg, L., Ürge-Vorsatz, D. (2022). What the latest science on climate change mitigation means for cities and urban areas. Indian Institute for Human Settlements. <https://doi.org/10.24943/SUPSV310.2022>
  12. Sharmin F., and **S. Dhakal** (2022). A composite energy resilience performance indicator for Bangladesh. Submitted to *Energy Sources, Part B: Economics, Planning, and Policy*, 17:1, 2149901, Taylor and Francis. <https://doi.org/10.1080/15567249.2022.2149901>.
  13. Thola, J., P. A. Salam, **S. Dhakal**, and E. Winijkul (2022). Sustainable alternative options for open burning of corn residues: case of Mae Chaem District, Chiang Mai Province, Thailand. *Polish Journal of Environmental Studies* 31(6) 1-11. <https://doi.org/10.15244/pjoes/152067>.
  14. B. Cai , H. Liu , H. Pan, M. Zhao, T. Zheng, J. Nie , M. Du, **S. Dhakal**. High-resolution accounting of urban emissions in China. *Applied Energy*, 325 (2022) 119896, Elsevier. <https://doi.org/10.1016/j.apenergy.2022.119896>
  15. Champeecharoensuk, T., P. Abdul Salam, **S. Dhakal**, N. Chollacoop (2022). Key Driver Analysis of Greenhouse Gas Emissions in Thailand's Public Bus Transport with Comparative Study on Metropolitan Bangkok Hotspots. Accepted for publication to *Energy for Sustainable Development*, 70 (October 2022), 456-465, Elsevier. <https://doi.org/10.1016/j.esd.2022.08.019>
  16. Khan M. R. and **S. Dhakal** (2022). Do experts and stakeholders perceive energy security issues differently in Bangladesh? *Energy Strategy Review*, 42 (July 2022), 100887. <https://doi.org/10.1016/j.esr.2022.100887>
  17. Aryal, S., and **S. Dhakal** (2022). Medium-Term Assessment of Cross Border Trading Potential of Nepal's Renewable Energy Using TIMES Energy System Optimization Platform, *Energy Policy*, 168 (Sept 022), 113098. <https://doi.org/10.1016/j.enpol.2022.113098>
  18. **Dhakal, S.**, J.C. Minx, F.L. Toth, A. Abdel-Aziz, M.J. Figueroa Meza, K. Hubacek, I.G.C. Jonckheere, Yong-Gun Kim, G.F. Nemet, S. Pachauri, X.C. Tan, T. Wiedmann, 2022: Emissions Trends and Drivers. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley,



- (eds.)). Cambridge University Press, Cambridge, UK and New York, NY, USA.  
<https://doi.org/10.1017/9781009157926.004>.
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## Policy briefs, journalistic writing, and other publications

1. Le Quéré, C., Jo Clarke, **S. Dhakal**, C. Goodess, A. Shrestha, M. Tebboth, C. Sutherland (2020). *Foundations for climate resilient and sustainable growing settlements (U-RES)*. Tyndall Center Working Paper. University of East Anglia, Norwich, UK. <https://tyndall.ac.uk/wp-content/uploads/2021/09/TWP-165.pdf>
2. (Policy Brief) **Dhakal, S.**, A. Shrestha, S. Singhal, S. Moloney, P. Vaughter, R. Darnsawasdi, S. M. Kim, C. Pharino, E. Haryono (2018). *Tracking Climate Actions for Climate Compatible Development in Cities*. Prosper.Net Policy Briefs, United Nations University, Tokyo.
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8. (Policy Brief) **Dhakal, S.**, Shrestha, S., Shrestha, A., Kansal, A., & Kaneko, S. (2015). *Towards a better water-energy-carbon nexus in cities* (APN Global Change Perspectives Policy Brief No. LCD-01). Kobe: Asia-Pacific Network for Global Change Research. <http://www.apn-gcr.org/2015/10/26/policy-brief-towards-a-better-water-energy-carbon-nexus-in-cities-lcd-01/>
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**Keynotes and invited talks (during 2023-2012 only)**

1. **Keynote Speaker** in International conference on “Sustainability of built environment and urban transition (SBEUT)”, Organized by EUniWell - European University for Well-Being at Linnaeus University in Växjö, Sweden, 12-13 October 2023. <https://lnu.se/en/sbeut2023>
2. Invited **talk** on “Impact of carbon price on Indonesia's power sector up to 2050”, Asian Integrated Assessment Modelling Workshop, Organized by Yonsei University Korea and Research Institute for Innovative Technology for Earth (RITE) Japan, Nara Kasugano International Forum and RITE, 29-30 September 2023, Japan.
3. Invited **talk** on “Cross-border power trade in South-East Asia: Lessons for South Asia”, China South-Asia Clean Energy Cooperation Forum, 24 September 2023, Organized by Chongqing Renewable Energy Society, Chongqing, China.
4. **Keynote Speaker** on “Why cities are crucial for the global climate change mitigation?”, Health in a Changing Climate Forum, Organized by Warrnambool City Council, Victoria State Government, and Barwon South West Climate Alliance, Australia, 25 May 2023. <https://www.lighthouse theatre.com.au/health-changing-climate-forum>
5. **Guest Speaker** on “Emissions and Mitigation Potentials of Cities in pathways towards the 1.5°C world”, The 2023 International Symposium on Just Transition towards Dec-carbonized Urban Systems, 11 February 2023, Organized by Academia Sinica and Future Earth Taiwan Hub, Academia Sinica Conference Hall, Taipei, Taiwan. <https://futureearth.org/event/2023-intl-symposium-of-just-transition-toward-de-carbonized-urban-systems/>



6. **Keynote Speaker** (Virtually) on “Rapid Renewable Energy Transition: Where do we stand and how to move forward?”, International Conference 100% Renewable Energy Policy Practice and Experience, Organized by 100% RE multi-sector partnership and the Alternate Energy Promotion Center (AEPC), 18-19 December 2022, Kathmandu, Nepal.
7. **Invited Speaker** on “Innovations and technology applications for clean and renewable energy transition in cities” at the International Conference on Innovation, Technology Transfer and Cooperation for Addressing Climate Change, Organized by Asian and Pacific Center for Transfer of Technology (APCTT) of UNESCAP, 6 December 2022, United National Conference Center, Bangkok.
8. **Invited Keynote Talk** (Virtually) on “Role of transforming lifestyle for energy transition towards the net-zero-emissions world”, 38th United National University Global Seminar: Energy Sustainability in the Anthropocene- Transforming Lifestyles for Carbon Neutrality, 4 December 2022 13:00–13.30 (JST), Tokyo, Japan.
9. **Invited Panelist** a global webinar by PLOS Climate Journal on “Dissecting the outcomes of COP27” (Panelists: Anjal Prakash- Bharti Institute of Public Policy, Indian School of Business, Géraldine Pflieger- Institute of Environmental Science, University of Geneva, Viktoria Spaiser- University of Leeds, Shobhakar Dhakal- Asian Institute of Technology, Nana Klutse- University of Ghana; Moderated by Emma Archer- PLOS Climate Editor-in-Chief and Jamie Males- PLOS Climate Executive Editor. Dec 2 Friday, 2022 11:00 AM in GMT.
10. **Invited Speaker** at UNFCCC COP27 on “Global emissions trends amidst enormous mitigation challenges” at the side event titled Current status and future perspectives on greenhouse gas emission mitigation and impacts, 8 November 2022 (1300-1430 EET), Japan Pavilion, Sharm El Sheikh, Egypt. Organized and invited by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC)’s Research Institute for Global Change (RIGC).
11. **Invited Speaker** on “Cross border trading potential of Nepal’s renewable electricity in the context of energy security and climate mitigation”. International Conference on Global Integrated Assessment Model (IAM) Development, organized by Yonsei University, October 14, 2022 at Korea Press Center, 18th Floor, The Seoul Foreign Correspondents' Club, Seoul.
12. **Invited Seminar** on “Emission trends and call for action in the context of climate change - key messages from IPCC AR6” to Indian Institute of Technology Guwahati, 16 September 2022, 12 noon IST (online).
13. **Invited Panelist** for 7<sup>th</sup> International Forum on Sustainable Future in Asia: Research for Societal Transformation with Future Earth. Session on Science and Society, 20 January 2022. Online event organized jointly by National Institute for Environmental Studies, Research Institute for Humanity and Nature/Nagasaki University, Institute for Future Initiatives of The University of Tokyo and RRCAP/Asian Institute of Technology, 20 January 2022 (online).
14. **Invited speaker** for Global Leaders Forum 2021 on the session “Energy Transformation and Carbon Neutrality 2050”, Organized by TV CHOSUN and K-Policy Platform, South Korea. This is a very high level event ([http://glfchosun.com/en/sub/sub03\\_01.php](http://glfchosun.com/en/sub/sub03_01.php)) attended by Prime Minister of South



- Korea and major global policy makers, 23 November 2021, Seoul, South Korea(online).
15. **Invited moderator** for online session on “Are universities doing enough to ensure climate resilience?”, Times Higher Education (THE) Campus Live Asia 2021, 14<sup>th</sup> December 2021 (Online).
  16. **Invited Moderator** for session on Energy Environment and Climate Change for AITAA’s First Global Symposium on “Sustainable Technology Innovations: with Social Impact in; Agriculture, Environment, and Digital Transformation”, 20 November 2021. Online global event organized by AIT Alumni Association, Vietnam.
  17. **Invited speaker** on International Climate Change Discourse: A casual look into past, future and Nepal's concerns at an exclusive seminar organized by Policy Research Institute Nepal, 2 November 2021, Kathmandu.
  18. **Invited speaker** delivering talk on Interaction of Urban Energy Systems and Infrastructure with Climate Change Mitigation at session Energy Transition and Low Carbon Green Development of 7<sup>th</sup> Asia Pacific Sustainable Energy Forum, Invited and organized by Asia Pacific Sustainable Energy Center (APSEC) of Asia Pacific Economic Cooperation (APEC), 15-17 September 2021, Tianjin, China (online).
  19. **Invited speaker** on Climate Change Mitigation in the Decade to 2030, Osaka University Anniversary Lecture Series: Climate Science in the Context of the SDGs: What to expect in the next decade, Osaka University, Osaka, Japan, 8 June 2021 (online).
  20. **Invited Speaker** on Global Trends of CO2 Emissions, Climate Negotiation and Paris Agreement, Sustainability Webinar Series, 09 February 2021 (07.30 -09.00, KTM by Zoom), Mid-Western University, Faculty of Humanities and Social Sciences, Kathmandu, Nepal (online).
  21. **Invited Speaker** on Effect of COVID-19 on Environment, Scientists Nepal 50<sup>th</sup> Session, 20 January 2021, Kathmandu, Nepal (by Zoom to over 50 participants from universities and think tanks) (online).
  22. **Panel organizer and moderator** on Panel 1- Sustainability: An Opportunity for Business”, AIT Enterprises Alliance “Towards 2030” Launch Event, 11 November 2020, Asian Institute of Technology, Thailand.
  23. **Invited talk** on “Mitigation Potentials and Strategies for Urban Transport in Asia and the Pacific” Virtual Regional Workshop on Urban Mobility and Impacts of COVID-19 on Mobility, 25-26 November 2020, United Nations Economic and Social Commissions for Asia and the Pacific, Bangkok.
  24. **Invited Plenary** Talk on “Challenges and Opportunities posed by COVID-19 pandemic to achieve Sustainable Development Goals (SDGs) in Nepal”, 2nd NRN Global Knowledge Convention (Online) on Diaspora for Innovation and Prosperity in Nepal: Post COVID-19 Scenario, Plenary 1: 14:30 - 16:30 P1: COVID-19 Impact on Nepal’s Economy and Path to Recovery, Kathmandu, Nepal, Non-Resident Nepali Association (NRNA), 10 October 2020.
  25. **Invited Guest Lecture and Seminar** on “Science-policy interface: the IPCC assessments delivering science for policy makers”, 24 September 2020, Dept. Of Built Environment and Energy Technology, Linnaeus University, Sweden (online).



26. **Invited talk** on “Mitigation potentials and strategies for transport in Asia and the Pacific”, Virtual Expert Group Meeting on Climate Change Mitigation and Adaptation in Transport, 22-23 September 2020, United Nations Economic and Social Commissions for Asia and the Pacific, Bangkok.
27. **Invited talk** on “Renewable Energy Development in Thailand”, Workshop on Energy Transition and Scaling-up Renewable Energy (Online Event), 10,00-16.40 hours, 17 September 2020, Organized by APEC Sustainable Energy Center at Tianjin University, China. Asia Pacific Economic Cooperation (APEC).
28. **Invited talk** on “Key Points on Impacts of COVID-19 to Nepal’s Sustainable Development Goals”, A webinar to present Result of a Study on Impact of COVID-19 on Nepal’s Sustainable Development Goals and Future Roadmap, 17 September 2020 (15.00-16.45 NST), Attended by Speaker of Nepalese Parliament, current and past ministers, members of parliament, top government officials and selected experts. Mid-Western University, Surkhet, Nepal (online).
29. **Invited talk** on “High Proportion Solar PV Utilization: Thailand”. The Approach to Increase the Share of Solar PV Capacity in ASEAN Warm up Seminar for China-ASEAN Clean Energy Capacity Building Programme 2020, SNEC 2020 PV Power Expo, Shanghai, 8 August 2020 (14:00-17:30 pm (GMT+8) organized by China Renewable Energy Institute and ASEAN Energy Center (online).
30. **Invited talk** on Normal or New Normal: What COVID-19 means to Nepal’s energy and environmental security, AIT Alumni Association-Nepal Webinar Series: Fourth Webinar on “Post Covid 19: Energy and Environment Security” in association with Mitra Kunj, 23rd May 2020, Saturday, 2-5 PM (online).
31. **Invited talk** on Energy Value Chain and Sustainability, Energy Management Programme at the University of Technology Petronas, Kuala Lumpur, Malaysia, 29 November 2019.
32. **Invited Speaker** on “Perspectives on infrastructure financing in Asia” at the Asian Development Bank book launch event alongside ADB Vice President, Infrastructure Financing in Asia, Robert B. Banks Auditorium, Asian Institute of Technology, 25 November 2019, Thailand.
33. **Keynote speaker** on “Urban resilience: Challenges and future pathways in Asia” at Leaders Dialogue session ‘Urban Resilience: Safeguarding and accelerating the achievement of the SDGs at the 7<sup>th</sup> Asia Pacific Urban Forum, Setia SPICE Convention Center, Penang, Malaysia.
34. **Invited Speaker** on “Energy transition in the context of SDGs and the Paris Agreement and the need for an integrated planning approach” at The Fourteenth Policy Consultation Forum of the Seoul Initiative Network on Green Growth: Enhancing and implementing NDCs with ambition and transparency” Asia Pacific Climate Week, UN Conference Center, Bangkok, Thailand, 2-3 September 2019.
35. **Invited Speaker** on “Cross-border electricity trade in BBIN region: Clarifying the existing scenario and way forward”, *One Day Seminar on Taking Nepal’s Energy Sector forward to International Best Practice*, Organized by AIT Alumni Association Nepal (AITAAN) under patronage of Government of Nepal, Ministry of Energy, Water Resources and Irrigation, 9 August 2019, Lainchour Banquet Hall, Kathmandu, Nepal.



36. **Invited Speaker** on “Opportunities for Developing Activities in Urban Carbon Sphere”, Annual Steering Committee Meeting of the Global Carbon project and Urban Data Workshop, 23-27 June 2019, Humphrey School of Public Affairs, University of Minnesota, Minneapolis, USA.
37. **Panelist** on “Solar Investment: The Trillion Dollar Opportunity” 28 May 2019, 12:30-14:30 hrs, Public Foyer, United Nations Conference Centre Bangkok, organized by International Solar Alliance (ISA). Panel discussions together with Regional Director and Representative of the UNEP Asia and the Pacific Office, Director, Energy Division, ESCAP, and Director of Southeast and South Asia, Global Energy Interconnection Development and Cooperation Organization (GEIDCO).
38. **Invited Speaker** on “Household’s consumptions and implications to energy requirements and related CO2 emissions: Case of Thailand, Vietnam and Philippines” SANDEE Summer Program, 08 May 2019, Asian Institute of Technology, Thailand.
39. **Invited Speaker** on “Connecting Asia: the benefits and challenges of regional grids”, Closed door parliamentary dialogue titled *Green grids: connecting Asia*, 28-30 March 2019, Organized by UK Foreign and Commonwealth Office and Climate Parliament, Wilton Park, Steyning, UK.
40. **Invited Speaker** on “Developing Asia-Pacific regional capacity in energy and resource modeling”, Workshop on Energy Planning Tool and Asian-Pacific Integrated Resources/Energy Modelling Platform, Organized by UNDP and A UNDP, and KTH-Sweden in partnerships with UN-DESA and UNESCAP, 21 March 2019, UN Conference Center, Bangkok.
41. **Panelist** on ‘Role of Digital Technologies and Blockchain for Climate Protection’. Consultation Workshop on Digital Technologies for Advancing Food Security, Climate Action and Environmental Sustainability, Organized by Asian Development Bank, Courtyard by Marriott Hotel, 14-15 March 2019, Bangkok.
42. **Invited Talk** on Key Findings of the Energy Future and Security in HKH Assessment, Launching and Media Dialogue of the Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People, 4 February, 2019, Venue: Main Conference Hall, ICIMOD, Kathmandu.
43. **Invited Talk** on Urban and infrastructure transitions, International Conference on System Transformations for Global Warming of 1.5 Degrees C, Global Center for Environment and Energy, 17 January 2019, Ahmedabad University, India.
44. **Panelist** on Systems Transition for Deep Decarbonisation, IPCC-CEEW Conference on ‘Road to the IPCC Sixth Assessment Report: Fostering deeper engagement with industry, finance and civil society stakeholders’, 15 January 2019, Desire Hall, Le Meridian Hotel, New Delhi.
45. **Panelist** on Sectoral transformation, policies and carbon pricing, Speaker at the Conference on Road to the IPCC Sixth Assessment Report: Fostering deeper engagement with industry, finance and civil society stakeholder, organized by Council for Energy, Environment and Water and Ahmedabad University, Delhi, India, 15 January 2019.
46. **Keynote Presentation**, The Future of Urban Governance and Capacities for Resilient Cities, Expert Group Meeting on the Future of Urban Governance and Capacities for Resilience, Friday 23rd November 2018, Meeting Room A, United Nations Conference Centre, Bangkok, Thailand.



47. **Invited panelist and statement**, *Climate science, IPCC and key issues for Asia*, Agenda Item 2: Environmental challenges in the context of the implementation of the 2030 Agenda for Sustainable Development (21<sup>st</sup> Nov), Committee on Environment and Development, Fifth Session, 21-23 Nov 2018, United Nations Conference Centre, CR2, Bangkok, Thailand.
48. **Invited Talk**, *Cities contributing to Climate Change Mitigation in 1.5°C constrained world*, South Asian Network for Development and Environmental Economics (SANDEE) Summer School, Bangkok, 8 May 2018, Asian Institute of Technology.
49. **Invited Talk**, *De-carbonization Benefitting from Improving Renewable Energy's Economics and Better Knowledge on Co-benefits*, Tenth meeting of the Research Dialogue (RD 10) of SBSTA of UNFCCC, 3 May 2018, Dialogue Room Santiago de Chile, World Conference Centre Bonn, Germany.
50. **Plenary Keynote Talk**: *Rapid transition to low carbon cities: reflections from past assessments*, Cities & Climate Change Science Conference, March 5-7, 2018, Edmonton, Canada <https://citiesipcc.org/>
51. *A global city CO2 emissions dataset with ancillary data for 187 cities from CDP* (with Cathy Nangini of LSCE France), Cities & Climate Change Science Conference, March 5-7, 2018, Edmonton, Canada (parallel session).
52. **Invited expert**, *Regional Partners Forum @Quito+1, Strategies and Priorities for the Implementation of the NUA in Asia and the Pacific*, 28-29 November 2017, Bangkok, Thailand, Hosted by UNESCAP and UN-Habitat.
53. *Energy situation in the HKH: Results from the HIMAP Assessment*, Workshop on “Hydropower-based collaboration in South Asia: Socio-economic development and electricity trade”, Organized by Institute of Water Policy (IWP) of Singapore National University and International Centre for Integrated Mountain Development (ICIMOD), ICIMOD, Kathmandu, 21-22 November 2017.
54. **Keynote Speech** on *Low Carbon Cities: Knowledge and Action Gaps and Opportunities for Asia*, 6th Annual Meeting of Low Carbon Asia Research Network (LoCARNet), Century Park Hotel Bangkok, 1-3 November 2017, Bangkok, Thailand
55. *Urban design and sustainable buildings*, Global Science, Technology & Innovation Conference, 23-25 October 2017, Belgium.
56. **Plenary keynote** on *Deep De-carbonization in 1.5 Degree World: Why cities are crucial?* Climate and Cities Conference 2017, 19-21 September, Potsdam Institute for Climate Impacts Research, Potsdam, Germany.
57. *Urbanization, cities and GHG emissions*, 16th Meeting of the Scientific Steering Committee, Global Carbon Project, 18-20 August 2017, Hotel City Oberland, Interkalen, Switzerland.
58. **Panelist**, Workshop on Coal in Asia: The Challenge for Policy and the Promise of Markets, June 8th 2017, Singapore, Hilton Hotel, 581 Orchard Road, Singapore, Organized by King Abdullah Petroleum Studies and Research Center of Kingdom of Saudi Arabia.
59. **Panelist and Speaker**, **High Level Panel on Sustainable Cities and Communities**, Vienna Energy Forum, Organized by UNIDO, IIASA, Austria Development Agency, SEE4ALL and Europe Integration Foreign Affairs of Republic of Austria, 11 – 12 May 2017, Hofburg Palace, Vienna.



60. **Invited Expert** to deliberate on to prepare IPCC's AR6 Scoping Document, AR6 Scoping Meeting, Inter-Governmental Panel on Climate Change (IPCC), 1-5 May 2017, Addis Ababa, Ethiopia.
61. *Human Settlements: Overview of the Fifth Assessment Report (AR5) Synthesis Report*, International Conference on Understanding Climate Change and Enabling Climate Action in the Hindu Kush Himalaya, Organized by ICIMOD, IPCC and Ministry of Population and Environment Nepal, 10-13 April 2017, Kathmandu, Nepal.
62. *Data sources for urban emissions*, Workshop on Decoupling in Workshop on Decoupling in Asia: An Infrastructure Transition Perspective, 15-17 March 2017, Organized by China-ASEAN Environmental Cooperation Center (CAEC) and the UN Environment's International Resource Panel, Jintai Hotel, Beijing.
63. *Energy security*, **Lead Presentation and Panel Moderator**, Symposium on Responding to Development Priorities of Nepal, 10 February 2017, Hotel Himalaya, Kathmandu.
64. *Green growth framework for national and city levels*, Workshop on Green Growth and Cities 16-18 January 2017, Institute of Advanced Studies, Lehmkuhlenbusch 4, 27753 Delmenhorst, Germany.
65. *Options for mitigation: IPCC 5th Assessment Report*. IPCC Media Workshop and Press Conference, 14 October 2016. Novotel Siam Square Hotel, Bangkok. Organized by IPCC and Office of Natural Resources and Environmental Policy and Planning of Government of Thailand.
66. *IPCC AR5: Key finding of AR5 for the ASEAN region*. IPCC Media Workshop and Press Conference, 14 October 2016. Novotel Siam Square Hotel, Bangkok. Organized by IPCC and Office of Natural Resources and Environmental Policy and Planning of Government of Thailand.
67. **Panelist**: *Panel on Science-Policy Interface Dialogue on Actions and Implications*, IPCC Outreach Workshop on IPCC Role, Activities and Findings. 15 October 2016, Novotel Siam Square Hotel, Bangkok. Organized by IPCC and Office of Natural Resources and Environmental Policy and Planning of Government of Thailand.
68. *Key findings of urbanization, cities and climate change mitigation in the IPCC Fifth Assessment Report*, IPCC Outreach Workshop on IPCC Role, Activities and Findings. 15 October 2016, Novotel Siam Square Hotel, Bangkok. Organized by IPCC and Office of Natural Resources and Environmental Policy and Planning of Government of Thailand.
69. **Keynote Talk**: *1.5° C Climate Stabilization: Needs for Science-Policy-Society interfacing*, The International Conference on Climate Change, Biodiversity and Ecosystem Services for Sustainable Development Goals: Policy and Practice, 27-29 June 2016, The Sirindhorn International Environmental Park, Cha-am, Thailand
70. **Panelist**: *Media's role in addressing climate change in an unprecedented era*, Panel Discussions on Climate Change Adaptation: Media for Disaster Literacy, 2<sup>nd</sup> Media Summit on Climate Change and Disaster Risk reduction, Asia Pacific Broadcasting Union, 12-14 May 2016, Krabi, Thailand
71. *Urbanization and Carbon Management*, Annual Meeting of Global Carbon Project, Carnegie Institution of Washington, 4 May 2016, Stanford University, USA.



72. **Plenary talk:** *An overview of mitigation contributions in NDCs of Asia*, 3<sup>rd</sup> CITIC Conference on Climate Change and Sustainable development, Organized by 30 March -1 April 2016, Pullman King Power Hotel, Bangkok.
73. *Key Findings of IPCC Mitigation Report in the Context of UNFCCC/COP21 Outcomes*, Invited Seminar on Climate Change and Sustainability, 28 March 2016, Suzukakedai Campus, Tokyo Institute of Technology, Tokyo.
74. **Panelist:** *Greening urbanization and low carbon cities*, Sustainable Energy and Technology Asia 2016 (SETA 2016), 23 - 25 March 2016, Bangkok, Thailand
75. *Key Findings of IPCC Mitigation Report in the Context of UNFCCC/COP21 Outcomes*, Invited Seminar by Society of Meteorology and Hydrology, at Nepal Tourism Board Conference Hall, Kathmandu, Nepal, 6 January 2016.
76. **Plenary talk:** *on Sustainable Consumption and Production and Climate Change: Crucial linkages and opportunities*, SWITCH-Asia Comprehensive Networking Conference, New Delhi, India, 4-6 November 2015.
77. *Sustainable cities: In rapidly urbanizing and carbon constrained world*, Asian Institute of Technology, 9 October, 2015 to Asia Pacific Initiative's online video platform to UNU, University of Hawaii, University of Samoa, RMIT and Keio University.
78. *Carbon Finance: Concept, Status and Examples on Cook stoves*, International Training on Design and Testing of Improved Cook stoves (ICS), Asian Institute of Technology, 8 October, 2015.
79. *Climate change 2014 Mitigation of climate change, IPCC fifth Assessment Report*, 4 September 2015 to Asia Pacific Initiative's online video platform to UNU, University of Hawaii, University of Samoa, RMIT and Keio University.
80. *Human Settlements and Climate Change Mitigation: Key findings from the latest IPCC WG3 report*, IPCC Fifth Assessment Report Outreach Event, Media Workshop, United Nations Conference Centre, Bangkok, Thailand, 17 August 2015.
81. *Human Settlements and Climate Change Mitigation: Key findings from the latest IPCC WG3 report*, IPCC Fifth Assessment Report Outreach Event, United Nations Conference Centre, Bangkok, Thailand, 17-18 August 2015.
82. **Plenary Keynote talk** *Future-cities in the carbon-constrained world* at International Scientific Conference Our Common Future Under Climate Change, 7-10 July 2015 Paris, France (With 2,200 registered participants, this was world's largest climate change conferences and aimed at influencing COP-15 of UNFCCC)
83. *Unprecedented urbanization and challenges to model them in IAMs* at Session S3322 (a) of International Scientific Conference Our Common Future Under Climate Change, 7-10 July 2015 Paris, France 3-4.30 PM at UPMC, 8 July 2015.
84. **Invited Expert for Cities Dialogue**, 8 July 2015, European Space Agency, Paris.
85. *Water-Energy-Carbon Nexus: Analogies of three Asian Cities Cases* by Asia Pacific Network for Global Change Research at their session at the Regional Forum on Climate Change (RFCC) – Low Carbon and Climate Resilient: Bridging Science, Practice, and Policy, 1-3 July 2015, AIT, Thailand.
86. Moderator for *Panel Discussion on Enhancing the actions for a better response to climate change in cities* at the Regional Forum on Climate Change (RFCC) – Low Carbon and Climate Resilient: Bridging Science, Practice, and Policy, 1-3 July 2015, AIT, Thailand.



87. *Urban carbon emissions* at 14<sup>th</sup> Annual Scientific Steering Committee Meeting of the Global Carbon Project at Hotel Mario Sorio, Hosted by Center for International Climate and Environmental Research – Oslo (CICERO), Oslo, 22-25 June 2015.
88. *Human Settlements and Climate Change Mitigation: Key findings from the latest IPCC WG3 report*, Annual Meeting of Low Carbon Society Research Network (LCS-RN), Collège des Bernardins, Hosted by The French Ministry of Ecology, Sustainable Development, and Energy & The International Research Center on Environment and Development (CIRED) 15-16 June, 2015, Paris.
89. *IPCC Assessment Process*, Humphrey School of Public Affairs, University of Minnesota, 27 March 2015, Minneapolis.
90. **Institute-wide Public Talk** on *Human Settlements and Climate Change Mitigation: Key findings from the latest IPCC WG3 report*, Humphrey School of Public Affairs, University of Minnesota, 26 March 2015, Minneapolis.
91. *Key Findings of IPCC 2014 Mitigation Report*, International Conference on Climate Change and Energy, 13-14 March 2015, Hilton Hotel, Gyeongju City, South Korea organized by Department of Climate Change and Energy, Kyungpook National University.
92. Webinar on *Cities, Climate Change and Technologies: An Introduction*, 25<sup>th</sup> February 2015, Organized by Climate Technology Center & Network, Asian Institute of Technology.
93. *Process of submitting CTCN request and sample request for CTCN assistance*, Bangkok Regional Workshop on Low Carbon Technology Transfer and Diffusion, Organized by Institute for Global Environmental Strategies and Asian Institute of Technology. 2-3 March 2015, Novotel Bangkok on Siam Square, Bangkok.
94. *Water-Energy-Carbon Nexus in Cities- Cases from Bangkok, New Delhi and Tokyo*, Expert workshop on “Development Planning and Decisions: Impact on Water Energy Food Nexus in Mekong Region, AIT Center, 22 January 2015, AIT, Thailand.
95. *Human Settlements and Climate Change Mitigation: Key findings from the latest IPCC WG3 report*, Global Carbon Project Workshop at Toyota High-level Symposium on Sustainable Cities, Toyota City, 16 January, 2015.
96. **Key-Note talk** on *Feasibility of 2 °C world: Key Findings from IPCC AR 5 WG III*, International Conference on Climate Change Innovation and Resilience for Sustainable Livelihood, 12-14 January 2015, Kathmandu, Nepal.
97. *Key messages from global assessments on urbanization and cities relevant to Asia in climate change mitigation*, Expert Group Meeting on Sustainable Urban Development in Asia and the Pacific: Towards a New Urban Agenda, United Nations Economic and Social Commission for Asia and the Pacific, 2-3 December 2014, Bangkok.
98. *Energy Sector Integration in ASEAN in the Context of AEC- Status and challenges*, The University of Tokyo Alumni Seminar on Roles of Thailand and Japan towards the ASEAN Economic Community, 1 November 2014, Patumwan Princess Hotel, Bangkok.
99. *Lessons and Key Findings from IPCC AR 5 WG III*, HKH Monitoring and Assessment Programme (HIMAP): Action to Sustain a Global Asset, 15-16 October, 2014, Organized by International Center for Integrated Mountain Development (ICIMOD), Kathmandu.



100. *Human Settlements and Climate Change Mitigation: Key findings from the IPCC AR5 WG3 report*, 14 October 2014, Kathmandu, Organized by UN-Habitat and Clean Energy Network Nepal.
101. *Human Settlements and Climate Change Mitigation: Key findings from the latest IPCC WG3 report*”, Mid-term Authors’ Conference of Second Assessment Report on Climate Change in Cities, 29 September 2014, Siemens, London.
102. *Key messages from Mitigation (WGIII) report: Emission trends and opportunities for low-carbon development*, Conference on IPCC AR5: What it means for a stronger, more inclusive India, India Habitat Center, 6 August 2014, organized by IPCC, CDKN, TERI and Government of India.
103. *Human Settlements and Climate Change Mitigation: Key findings from the latest IPCC WG3 report*, JICA Research Institute, 25 July 2014, Tokyo, Japan.
104. *AIT’s involvement in CTCN and key lessons*, Support for Developing Country through Climate Technology Center and Network (CTCN) in Asia, Yokohama, 25 July 2014, Organized by Institute for Global Environmental Research (IGES).
105. *Climate Technology Centre and Network (CTCN): Hub in Asia*, in Session: Financing Low-carbon Technology Transfer of Small-Medium-Enterprises (SMEs): Match-making Strategy, ISAP 2014, Yokohama, 24 July 2014.
106. *Human Settlements and Climate Change Mitigation: Key findings from the latest IPCC WG3 report*, Building Effective Agreements in Climate Negotiation towards Sustainable Growth, Organized by and at Asian Development Bank Institute, 7-8 July 2014, Tokyo, Japan.
107. *The Challenges of Urbanisation in the context of energy use and CO2 emissions*, At International Cooperation in the 21st Century: Partnerships for Delivering the Post-2015 Agenda, 27 - 28 May 2014, Chatham House, London.
108. *LEAP Modeling in Asia in the context of prevailing energy-emission models*, Strengthening the Asian Community of Practice on LEAP March 31- April 1, 2014, AIT, Thailand, Organized by USAID, LEAD, AGMC and AIT.
109. *Green energy for sustainable development- Global Needs, options and challenges*, At Symposium on Embracing Green Growth Opportunities in South-east Asia, Bangkok, 7 November 2013, Organized by Friedrich-Ebert-Stiftung Thailand Office.
110. *Carbon, Energy, and Urbanization Nexus*, Asian Pacific Youth Forum- Mountain Issues and Post-2015 Development Agenda, 30 September – 4 October 2013, Kathmandu, organized by ICIMOD.
111. *Understanding and quantifying the water-energy-carbon nexus for low carbon development in Asian cities*, ISAP2013, Yokohama, 25 July 2013.
112. *What it takes to facilitate low carbon technologies?* Second Annual Meeting of Low Carbon Asian Research Network, Yokohama, 24-25 July 2013, Organized by IGES Japan.
113. *Cities and climate change mitigation: Evolving research agendas*” Research Symposium of SANDEE, 22<sup>nd</sup> June 2013, Tide Resort, Chonburi, Thailand.
114. *Key activities in Asia regarding low carbon cities*, The workshop of urban thematic group of Sustainable Development Solution Network (SDSN), Rockefeller Foundation- Bellagio Center, 24 April 2013, Bellagio, Italy.



115. *Challenges of climate compatible urban development: Towards assessment and scenario framework*, International Workshop on Climate Compatible Urban Development: Towards developing assessment framework for cities, 12-13 March 2013, Novotel Bangkok on Siam Square (Renoir room), Bangkok. Organized by AIT and Global Carbon Project.
116. *Promoting technology transfer in mitigation and adaptation: Challenges and opportunities for CTCN and other bilateral mechanisms*, IGES/TERI Policy Dialogue, 26 February, 2013, India Habitat Center, New Delhi.
117. *Urbanization, urban infrastructure and low carbon cities*, Annual Meeting of Low Carbon Society Research Network, The University of Oxford, 17-18 September 2012, UK.



## Selected professional activities

### Intl Conference on Bridging Peace and Sustainability amidst Global Transformations

August 2022 March 2023

Global

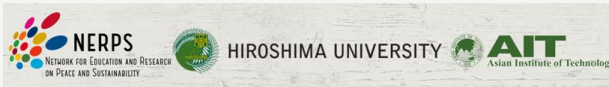
- 1 To build global network for education and research on peace and sustainability
- 2 To create a forum for scholars and stakeholders to dialogue on peace and sustainability
- 3 Organizing AIT-Hiroshima University 2023 International Conference on Peace and Sustainability

#### AIT Lead Faculty:

Prof. Shobhakar Dhakal, Conference Co-chair



**NERPS CONFERENCE 2023**  
FEB 28-MAR 3 at AIT Conference Center, Thailand  
Bridging Peace and Sustainability amidst Global Transformations



30 OCT 2022 Deadline for Abstracts  
15 NOV 2022 Notification of Acceptance  
1 DEC 2022 Early Registration Deadline  
15 JAN 2023 Regular Registration Deadline  
VISIT WWW.NERPS.ORG FOR MORE INFORMATION

### Project: Promoting Himalayan Development by Strengthening Teaching and Research on Sustainable Development Goals

Jan 2022 Dec 2025

- 1 Strengthen teaching and research on the SDGs in the HKH
- 2 Co-develop and implement introductory and advanced courses related to global sustainability
- 3 Promote North-South and South-South research exchanges on topics related to sustainability and networking
- 4 Transfer the co-developed courses to other universities in the HKH region
- 5 Publish its outcomes in scientific journals together with press releases and conduct policy workshops



Förderung der Entwicklung des Himalayas durch  
Stärkung von Lehre und Forschung im Bereich der  
Sustainable Development Goals (**ForHimSDG**)



#### AIT Lead Faculty:

Prof. Shobhakar Dhakal



Thailand, Nepal, India, Bangladesh, Bhutan, Pakistan, Myanmar, Afghanistan



## UNEP Synthesis Report: "Making Peace With Nature: A scientific blueprint to tackle the climate, biodiversity and pollution emergencies" 18 FEBRUARY 2021

- **Contributing author to the high level UNEP synthesis report** based on evidence from global environmental assessments
  - UN Secretary-General António Guterres, and Executive Director of the UNEP Inger Andersen launched the report ahead of the fifth United Nations Environment Assembly (UNEA-5)

### Key messages

- Unsustainable development is rapidly degrading Earth's capacity to sustain human well-being
- The world is failing to meet its commitments to limit environmental damage
- Earth's interrelated environmental emergencies must be addressed together
- Human knowledge, ingenuity, technology and cooperation can transform societies
- and economies and secure a sustainable future
- Transformed economic and financial systems can power the shift to sustainability
- Everyone has a part to play in the transformation to a sustainable future



<https://www.unep.org/resources/making-peace-nature>



**Contributing Author**  
Prof. Shobhakar Dhakal



## Project: Clean Energy Finance in the Countries of ASEAN

March 2020

May 2021

- 1 Status and targets of renewable energy development
- 2 Clean Energy Financing in ASEAN
  - ❑ Investment Needs
  - ❑ Financing gaps
  - ❑ Prevailing Financing Sources
- 3 Regional Cooperation in Energy Financing
- 4 Policy Instruments and Financing Mechanisms
  - ❑ Policy support instruments
  - ❑ Financing mechanism and instruments
- 5 Key lessons from ASEAN's experience
- 6 Challenges and Barriers: Regulatory, financial and market, capacity Gaps



**AIT Lead Faculty:**  
Prof. Shobhakar Dhakal



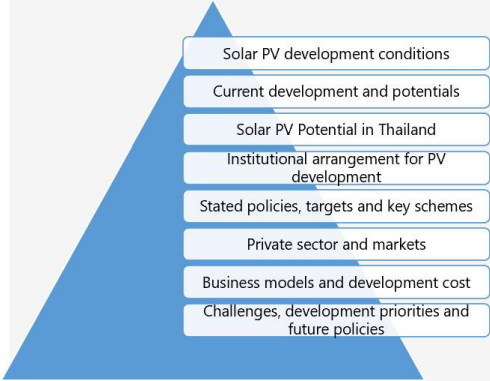
<https://www.adb.org/publications/financing-clean-energy-developing-asia>



## Project: Solar PV Development in Thailand


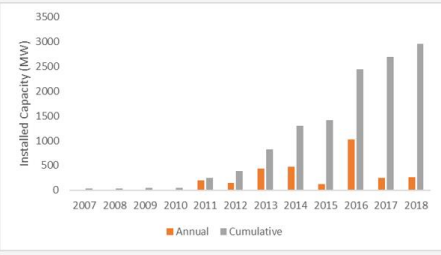
March 2020    Sept 2020

**Objective**  
A holistic assessment of solar PV development in Thailand



- Solar PV development conditions
- Current development and potentials
- Solar PV Potential in Thailand
- Institutional arrangement for PV development
- Stated policies, targets and key schemes
- Private sector and markets
- Business models and development cost
- Challenges, development priorities and future policies

**AIT Lead Faculty:**  
Prof. Shobhakar Dhakal

**PV value chain in Thailand**

- Cell and PV module fabrication
- Inverter and battery business (manufacturers and distributors)
- Ground mounted PV power plants
- Rooftop PV systems
- Floating PV systems
- Services of the operations and maintenance business
- Data information & communication services and
- PV recycle business

**Logos:** CREEI China Renewable Energy Engineering Institute, AIT Asian Institute of Technology



## Project: Greenhouse Gas Emissions and Mitigation Potentials from Passenger Transport in Asia and the Pacific

April 2019    December 2019


**UN ESCAP Region**

- To clarify the role of passenger transport in the region for energy consumption
- To provide business-as-usual energy and CO<sub>2</sub> emissions scenarios of passenger transport in the region
- To quantify the role of the various passenger transport related policy options, namely, fuel efficiency improvements, scaling up the electric mobility and the promotion of public transport


**AIT Lead Faculty:**  
Prof. Shobhakar Dhakal

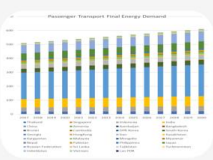
**Passenger Transport**



**SDG and NDC links**



**Avoid-Shift-Improve Framework**



**Selected Scenarios for the Asia Pacific Region**

**Logos:** UNITED NATIONS ESCAP Economic and Social Commission for Asia and the Pacific, AIT Asian Institute of Technology

<https://www.freemages.com/photo/public-transportation-1460659>  
Valantis 2014



# Project: Evidence-based Policies for the Sustainable Use of Energy Resources in the Asia-Pacific Region- Thailand's Renewable Energy Policies

## Aim

- 1 Enable evidence based policy-making for renewable energy development and evaluate its impacts on Thailand's existing goals and targets for Renewable Energy.
- 2 Review and evaluation of Thailand's Renewable Energy Policies and its Progress..
- 3 Identify what more needs to be done to achieve Thailand's RE targets, including identification of new policies, options and pathways, integrated analysis of energy sector across sectors, and quantification of the impacts using modelling tools and techniques

*Joint collaboration of Asian Institute of Technology (AIT), UN Economic and Social Commission for Asia and the Pacific (ESCAP) and Department of Alternative Energy Development and Efficiency (DEDE) of Royal Thai Government*

The logo for the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). It features the United Nations emblem on the left and the word "ESCAP" in large blue letters, with "Economic and Social Commission for Asia and the Pacific" written below it.

The logo for the Asian Institute of Technology (AIT). It is a circular seal featuring a map of Asia in the center, surrounded by the words "ASIAN INSTITUTE OF TECHNOLOGY" and the year "1959" at the bottom.

The logo for the Department of Alternative Energy Development and Efficiency (DEDE). It consists of a stylized orange flame icon.

Department of Alternative  
Energy Development and Efficiency  
**MINISTRY OF ENERGY**

## AIT Lead Faculty:

Prof. Shobhakar Dhakal  
Prof. S. Kumar  
Dr. Ekbordin Winijkul

Three small portrait photographs of the AIT lead faculty members: Prof. Shobhakar Dhakal, Prof. S. Kumar, and Dr. Ekbordin Winijkul.

November 2018

July 2019

A photograph showing several wind turbines against a sunset sky with silhouettes of trees in the foreground.

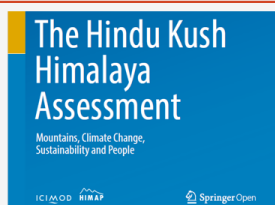
A photograph showing solar panels in the foreground and a modern city skyline with skyscrapers in the background under a clear blue sky.

A close-up photograph of bright yellow and orange flames burning over dark logs or wood.



## Meeting Future Energy Needs in the Hindu Kush Himalaya

Feb 2017 Jan 2019



### Policy relevant knowledge synthesis impacting

- the 240 million hill and mountain people across the eight countries sharing the region
- the 1.65 billion people in the river basins downstream

- 1 First of its kind regional energy assessment
- 2 Solution-oriented and forward looking consolidate knowledge
- 3 High profile multi-institute collaborative assessment

### Key findings and messages

- ❖ HKH, despite having huge hydropower potential of ~500 GW, remains energy poor and vulnerable
- ❖ Measures to enhance energy supply have had less than satisfactory results because of low prioritization and a failure to address challenges of remoteness and fragility
- ❖ Inadequate data and analyses are a major barrier to designing context-specific interventions
- ❖ Quantitative targets (with quality specifications for RE options) based on an explicit recognition of the full costs and benefits should be the basis of designing policies, prioritizing actions and strengthening investments
- ❖ Governments need to prioritize use of locally available energy resources
- ❖ A high-level, empowered, regional mechanism should be established to strengthen regional energy trade and cooperation.

**Coordinating lead author**  
Prof. Shobhakar Dhakal



### Coordinating Lead Authors

- Shobhakar Dhakal, AIT, Thailand
  - Leena Srivastava, TERI University, India
  - Bikash Sharma, ICIMOD, Nepal
- Lead Authors**
- Debajit Palit, TERI, India
  - Brijesh Mainali, Linnaeus University, Sweden
  - Rabindra Nepal, University of Tasmania, Australia
  - Pallav Purohit, IIASA, Austria
  - Anandajit Goswami, TERI University, India
  - Ghulam Mohd Malikyar, National Environmental Protection Agency of Afghanistan
  - Kul Bahadur Wakhley, Bhutan

## Project: Foundations for Climate Resilient and Sustainable Growing Settlements (U-Res)

December 2016 December 2017

Focus on African Cities

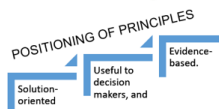
- 10 Developing Key Principles of Climate Resilient and Sustainable Urbanization

- The objectives are to provide guidance to decision-makers who are responsible for addressing low carbon and climate resilient development in cities

- This guidance must be vetted-well in evidence-based science.

- Joint collaboration between prominent institutions in UK, Africa and Asia

### Structure of each key principles



### Co- Investigators:

Professor C Le Quere, University of East Anglia (PI)  
Dr Joanne Clarke, University of East Anglia  
Professor Richard Dawson, Newcastle University  
Dr Oliver Wasonga, University of Nairobi  
Dr Shobhakar Dhakal, Asian Institute of Technology  
Dr Mark Tebboth, University of East Anglia

**AIT Lead Faculty:**  
Prof. Shobhakar Dhakal



### The Context

- A Need to re-orient the expected 'new' urbanization in emerging regions. IPCC and other recent assessments have said that a large opportunity exists here, and next two-three decades are crucial. Africa and Asia are urbanization hotspots
- B Need to make "existing cities" low carbon & climate resilient: large fraction of population already live in cities. This requires adapting existing cities and making them efficient.
- C Climate concerns adds over other sustainability challenges for cities. Climate concern must also address other sustainability concerns cited face, especially for most vulnerable groups.
- D City decision makers make collectively the urban-wide and sectoral planning, and address multiple concerns at once; therefore, synergies and trade-offs of addressing climate concern for urban development must be given due care.
- E Urbanization in Africa are distinct on few fronts, mainly, prevalence of poverty, informality, traditional way of governance, reflection of rural way of life, and the peri-urban dominance; these must be reflected well.



Tyndall Centre  
for Climate Change Research

### Partners



BURUHAPPOLD  
ENGINEERING

### Funded by (UK)

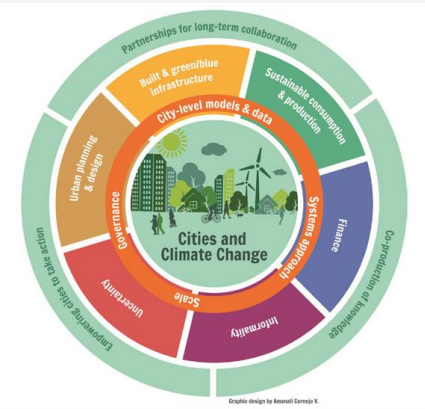




## International Conference on Climate Change and Cities CitiesIPCC Conference, 5-7 March 2018, Edmonton, Canada

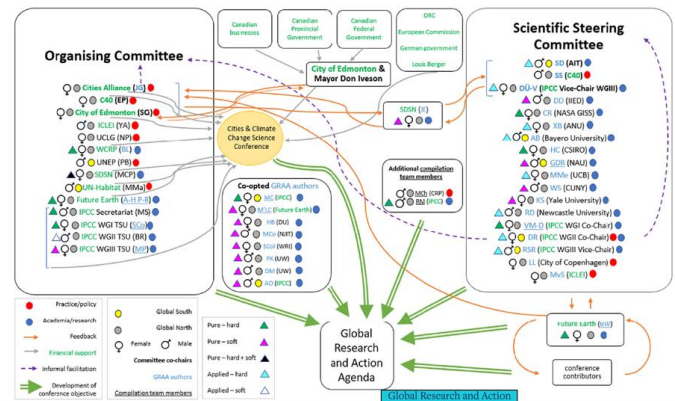


Co-Chair of Scientific Steering Committee



### Pathways for climate adaptation and mitigation in cities

This figure presents the structure of the Global Research and Action Agenda on Cities and Climate Change Science. The inner circle (orange) presents key crosscutting issues and knowledge gaps for a step-change of knowledge generation on cities and climate change. The middle circle (multi-coloured) presents six topical research areas where more evidence is needed to inform action. The external circle (green) presents three suggested approaches that may facilitate implementation of this Research and Action Agenda.



Co-creation between cities and climate change science achieves research and action agenda.

Hunter et al. (2022). *Current Research in Environmental Sustainability*  
<https://doi.org/10.1016/j.crsust.2022.100189>



## Leadership to Inter-Governmental Panel on Climate Change (IPCC)- Fifth (2014) and Sixth (2021) Mitigation Assessment Reports (WGIII)

### Fifth Assessment Reports (WGIII/AR5) published in 2014

- 1 Summary for Policymakers
- 1 Technical Summary
- 16 Chapters
- 235 Authors
- 900 Reviewers
- More than 2000 pages
- Close to 10,000 references
- More than 38,000 comments



2007 Nobel Prize winning IPCC prepares comprehensive Assessment Reports about knowledge on climate change for policy makers



**Prof. Shobhakar Dhakal**  
Coordinating Lead Author (CLA) in AR5 & AR6



AR5: Chapter 12 Human Settlements, Infrastructure and Spatial Planning

AR6: Chapter 2 Emissions Trends and Drivers

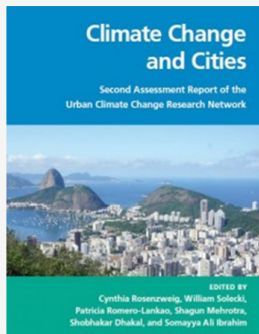
### Sixth Assessment Reports (WGIII/AR6) to be published in April 2022

Framing (1 chapter)	
1. Introduction and framing	High-level assessment of emission trends, drivers and pathways (3 chapters)
2. Emissions trends and drivers	
3. Mitigation pathways compatible with long-term goals	
4. Mitigation and development pathways in the near- to mid-term	
Sectoral chapters (8 chapters)	
5: Demand, services and social aspects of mitigation	
6: Energy systems	9. Buildings
7: Agriculture, Forestry, and Other Land Uses	10. Transport
8. Urban systems and other settlements	11. Industry
12. Cross sectoral perspectives	
Institutional drivers (2 chapters)	
13. National and sub-national policies and institutions	
14. International cooperation	
Financial and technological drivers (2 chapters)	
15. Investment and finance	
16. Innovation, technology development and transfer	
Synthesis (1 chapter)	
17. Accelerating the transition in the context of sustainable development	

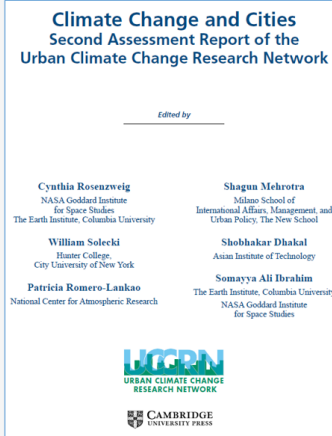


## Climate Change and Cities: Second Assessment Report of the Urban Climate Change Research Network Report (UCCRN)

Nov 2013 Nov 2017



- 1 AIT Faculty co-led UCCRN's Second Assessment Report on Climate Change in Cities
- 2 A high profile global scientific knowledge synthesis for city policy makers
- 3 Involving over 500 scientists over 2013-2017 from all continents
- 4 A major global publication by Cambridge University Press in print in May 2018



**SCIENCE FOR CITIES**

**Urban Climate Change Research Network**  
EARTH INSTITUTE | COLUMBIA UNIVERSITY



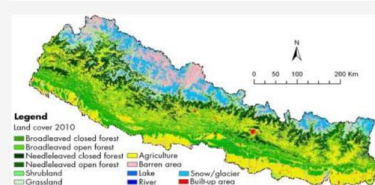
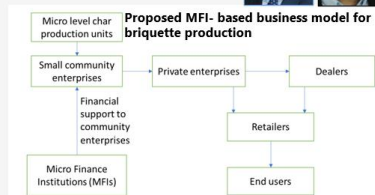
**Prof. Shobhakar Dhakal**  
Co-editor of Second Assessment  
Member of Global Management Team (2013-17)

## Project: Developing Policy Framework and Business Model to Promote Sustainable Use of Biomass Briquettes in Nepal

Nov 2016 July 2018

- A project requested by the Government of Nepal through Climate Technology Centers and Network (CTCN) of UNFCCC
- Developed business model and policy framework for Government of Nepal to upscale carbonized and un-carbonized (densified biomass and pellets) briquettes
- Series of studies on Nepal's bio-briquette situation, challenges, existing policies, stakeholder workshops, business-policy-academia consultations, SWOT analysis of proposed models

**AIT Lead Faculty:**  
Dr. P. Abdul Salam  
Prof. Shobhakar Dhakal



**AIT**  
Asian Institute of Technology

**CTCN**  
CLIMATE TECHNOLOGY CENTRE & NETWORK



**Ministry of Population and Environment**



## Project: Energy Efficiency Initiatives in Asia and Action Plan to Support Countries

Jun 2014 Feb 2015

- 1 Identification of past successful energy efficiency initiatives with a regional and country-specific focus
- 2 Barriers that are identified that need to be addressed
- 3 Prioritizing countries based on energy efficiency opportunities (sectoral/sub-sectoral level, and overall)
- 4 Identification of few countries to target for support
- 5 Conducting consultations with relevant national organizations to develop action plan to identify opportunities for energy efficiency policies and programs.

**AIT Lead Faculty:**  
Prof. S. Kumar  
Dr. P Abdul Salam  
Prof. Shobhakar Dhakal



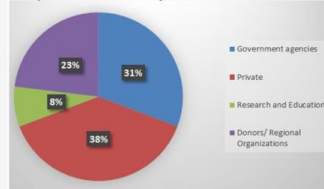
Summary of energy efficiency status and opportunities in selected Asian countries

Existing initiatives (I)	Industry	1.0	1.0	0	1.0	1	1	0	Opportunities (O)
SMES	1.0	0	0	0	0	1.0	0	0	
Transport	0					0	0	0	
Residential commercial			1	1			0	1	1.0
Building	0				1.0				
Agriculture				0					
Energy generation	1.0		0	0	1.0			0	
Technical	B.A	B.A	B						
Policy	B	B.A	B.A	A	B.A	B.A	A	B.A	
Institutional (Capacity building)	B.A	A	B.A	B.A	B.A	B.A	B.A	B.A	
Financial	B.A	B.A	B.A	B.A	B.A	B.A	B.A	B.A	
Countries	Bangladesh	Cambodia	Indonesia	Kazakhstan	Malaysia	Mongolia	Philippines	Thailand	Vietnam

### Methodology



### Responses from key stakeholders

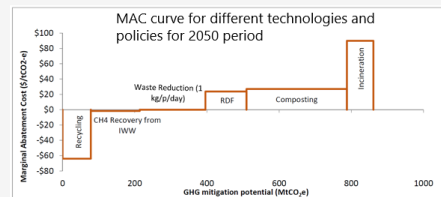
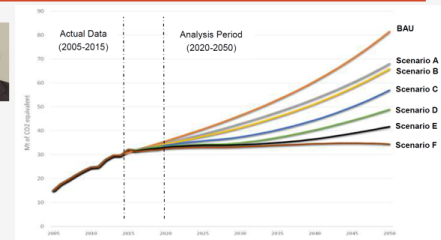
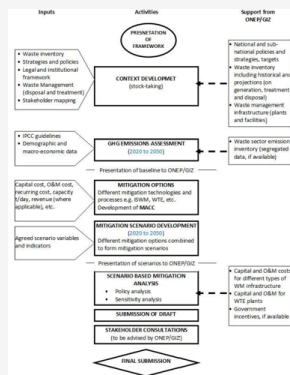


## Project: Mitigation Options in the Thai Waste Sector (post-2020) and Their Contributions to GHG Mitigation

Apr 2015 Feb 2016

- Assist Office of Natural Resources and Environmental Policy and Planning (ONEP) in developing INDCs of Thailand
- Quantify the past GHG emissions from waste sector and determine future emissions under Business-as-Usual up to 2050
- Identify potential mitigation options, develop Marginal Abatement Cost Curve (MACC), develop mitigation scenarios and present a comparative analysis of mitigation scenarios
- Describe co-benefits of mitigation options and quantify costs of co-benefits,
- Provide policy recommendations for the Thai Government to cost-effectively reduce GHG emissions from waste sector.

**Lead Faculty**  
Dr. P. Abdul Salam  
Dr. Shobhakar Dhakal  
Dr. Thammarat Koottatep  
Prof. C. Visvanathan



สำนักงานนโยบายและแผนทรัพยากรธรรมชาติและสิ่งแวดล้อม  
Office of Natural Resources and Environmental Policy and Planning



giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH



AIT Asian Institute of Technology



## Project: Tracking Influences of Asian Urban GHG emissions for Sustainability Policies: Identifying Low Carbon Pathways to meet the Paris Agreement

September 2017 - October/December 2019

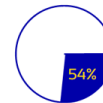


### List of Major Collaborators

Name	Institution	Country
Shu-Li Huang	Taipei National University	Taiwan
Deng Xiangzheng	Inst. of Geo.Sc & Natural Resources Research, CAS	China
Shobhakar Dhakal	Asian Institute of Technology	Thailand
Wang Kwangik	Urban Research Division, Korean Research Institute for Human Settlements	Republic of Korea
Alexandros Gasparatos	University of Tokyo	Japan
Corrie Griffith	UGECC (future Earth)	USA
Peter J. Marcotullio	Hunter College, CUNY	USA

### KEY OBJECTIVES

- To develop historical sub-city (administrative district) level energy and GHG inventories for Seoul, Taipei, Beijing, Bangkok, Tokyo and New York City.
- To identify forcing variables for energy use and GHG emission changes over time for sub-city units and metropolitan areas and test the strength of these variables on both the home city and use these results to synthesize efforts across different cities.
- To develop a collaborative research network that will continue to engage in and inspire similar research
- To disseminate results and engage with the policy community and stakeholders at different scales to seek comments and improvements and influence change.



Asia's share of global GHG emissions is 54%

Led by: Prof Peter J. Marcotullio  
Hunter College  
City University of New York,  
peter.marcotullio@hunter.cuny.edu

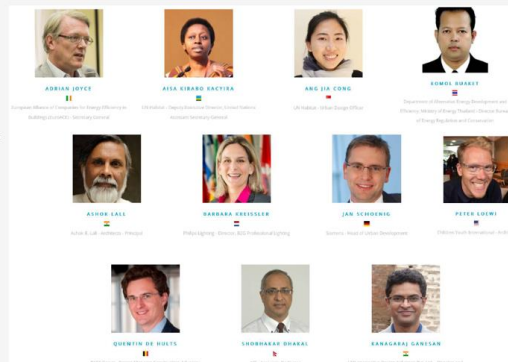
Funded by



## Partnership for Global Science Technology and Innovation Conference (G-STIC), 23-25 October 2017 Brussels

Jan 2017 Dec 2017

- Developing concept and background paper on theme "Urbanization"
- Develop stakeholder network, partners and speakers
- Developing the program for the theme "Urbanization" for the conference



- Challenges and opportunities for sustainable building with focus on energy
- Technologies and knowhow that are critical
- Insights on key barriers
- Policy changes that needs to happen for transformative change

AIT Lead Faculty  
Prof. Shobhakar Dhakal



<https://www.gstic.org/past-events/gstic-2017/>



## Project: Understanding and Quantifying the Water-Energy-Carbon Nexus for Low Carbon Development in Asian Cities

Aug 2013

May 2016

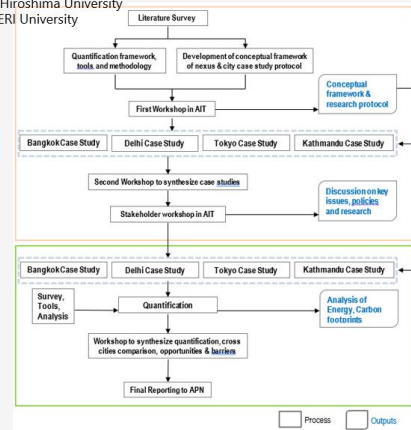
- Characterizing nature of WEC Nexus in **Bangkok, Delhi and Tokyo**

- Quantifying the nexus to determine the extent of the direct and indirect importance and to exemplify the potentials of the nexus to the low carbon development in cities

- Gauging the extent and relevancy of addressing the barrier and opportunities for optimizing the nexus, as well as influence the policy for low-carbon development



Dr. Shobhakar Dhakal, AIT  
Dr. Sangam Shrestha, AIT  
Mr. Ashish Shrestha, AIT  
Prof. Shinji Kaneko, Hiroshima University  
Prof. Arun Kansal, TERI University



Project Reference Number: LCI2013-02CMY(R)-Dhakal



**AIT**  
Asian Institute of Technology



HIROSHIMA UNIVERSITY

