Climate Change in Asia Pacific: Science and Solutions

Course Coordinators:
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Dates/Time: 6 October 2022 to 2 February 2023, Thursday, 13.00am to 14.30pm, JST. Via Zoom.

Introduction: The latest report from the Intergovernmental Panel on Climate Change (IPCC) states that it is "unequivocal" that humans have warmed the planet, causing widespread and rapid changes to Earth's oceans, ice and land surface. There are observed impacts related to the intensity and frequency of weather extremes as well as, for example, sea level rise. The world's current and projected reliance on fossil fuels implies pushing towards an increase of 5°C. Scientists and world leaders have agreed that a 2°C target is important to avoid dangerous, runaway climate change. In almost all emissions scenarios, however, global warming is expected to hit 1.5°C in the early 2030s.

To limit warming at below 2°C requires reaching net zero emissions around 2050. The IPCC argues if emissions continue at current rates, the global carbon budget could be exhausted as early as 2035. The window of opportunity to begin the transformation society to shift away from fossil fuels is closing, and emissions must begin declining rapidly from 2020 onwards. This transition, away from fossil fuels to renewables and a sustainable future, will impact on how our societies are organized and function. These efforts require massive societal transformation, from the policy arena to everyday behaviors – at global, national and local scales.

This multi-disciplinary, video-conference enabled collaborative course examines the science and responses to climate change across the Asia-Pacific region. This course connects students and faculty via Zoom from a network of universities in the region (including students on the virtual exchange students).

Eligibility: P/G and U/G depending on the arrangements at each partner university

Collaborating Institutions: This class is a collaboration between the University of Osaka, Waseda University, Tsukuba University, National University of Samoa, and the University of Hawai'i at Mānoa. A faculty member at each participating university has responsibility for supervision of their students and for the evaluation of student assignments. This class was an early pioneer of synchronous distance learning, from 2003. With the COVID-19 global pandemic it has been moved an entirely virtual mode of delivery. This year we will be exploring greater integration of students from across the universities, through the use of break-out sessions and other "zoom" features.

Learning Objectives: The objective of this course is to explore the impacts and responses to climate change in the context of the Asia/Pacific region. As a result of this class, students will have competency in:

- current and expected climate change impacts;
- understanding of a wide array of short, medium and long-term climate change adaptation measures;
- understanding of greenhouse gas reduction strategies from a multi-country and regional perspective.
- ability to identify some major social and economic challenges facing the Asia Pacific region in the context of climate change.

- Understanding of system-wide and individual approaches to making a low carbon transition.

Course Syllabus (Subject to Change):

Sessions	Date	Topic	Lecturer	Format
Session 1	6-Oct 2022	Course Introduction Climate Science and Expected Impacts	Brendan Barrett (OU)/Makena Coffman (UH) Chip Fletcher (UH)/	Lecture/Discussion
Session 2	13-Oct 2022	Student Breakout Session - Measuring Carbon Footprints		Breakout Discussion
Session 3	20-Oct 2022	Australian Bushfires of 2019/2020	Lauren Rickards (RMIT University)	Lecture, Discussion
Session 4	27-Oct 2022	Student Breakout Session – 1.5C Lifestyles	Lewis Akenji, report author, available for discussion with students.	Breakout Discussion
Session 5	10-Nov 2022	Climate Change, Sea Level Rise and Coastal Cities & Coral Reefs	Dolan Eversole (UH)/Takashi Nakamura (RU)	Two 30 min lectures/Discussion
Session 6	17-Nov 2022	Accelerating Decarbonisation	Brendan Barrett (OU)	Lecture, Discussion, Breakout
Session 7	24-Nov 2022	IPCC, UNFCCC and COP27	TBD	Lecture, Discussion, Breakout
Session 8	1-Dec 2022	Renewable Energy in Samoa	Government of Samoa	Lecture, Discussion
Session 9	8-Dec 2022	Carbon Neutral Hawaii by 2045	Makena Coffman (UH)	Lecture, Discussion,
Session 10	15-Dec 2022	Net-Zero Carbon Japan and 100% Renewable	Kentaro Tamura (IGES) and Yuko Nishida (REI)	Lecture, Discussion,
Session 11	22-Dec 2022	Student Presentations (Pecha-kucha format)		
Session 12	12-Jan 2023	Climate Change and Asian Cities	Chao Ren (The University of Hong Kong)	Lecture, Discussion
Session 13	19-Jan 2023	Carbon Divestment and Stranded Assets	CDO Mizuka Ida (CDP Japan)	Lecture, Discussion
Session 14	26-Jan 2023	Food and Climate Change	Kazuo Watanabe (UoT)	Lecture, Discussion
Session 15	2-Feb 2023	Flipped Classroom/Student Discussion	All	Discussion and Wrap-up

Course Requirements and Grading Policy: This course requires class participation and engaged discussion. As this year's course will be held entirely virtually, it is required that video remain on throughout the weekly seminar, except for special circumstances. Small assignments to foster discussion across the multiple institutions will be implemented on ad hoc basis; for example, to estimate your carbon footprint using an online calculator to share in a break-out room.

Readings will be provided via Dropbox, or be available via online accessible links. Documentaries will be provided via online accessible links when possible, otherwise students will have to access them via paid services like Netflix or Amazon Prime. Students are expected to prepare by completing readings prior to relevant lectures. Assignments and grading are as follows:

Class Participation 10%
(Attendance & Contribution to Cross-Institution Collaboration)

Individual Carbon Transitioning Discussion	20%
1.5C lifestyles Discussion	20%
Pecha Kucha Presentation	30%
Report	20%

Assignment 1: Class Participation (10%)

Asking questions and participating in discussions are crucial parts of this course. The level of student engagement in Zoom sessions and student understanding of the issues covered as well as relative comprehension of the subject matter will be evaluated.

Assignment 2: Carbon transitioning - individual, community and societal changes

Part 1: Discussion of your carbon footprint. (20%)

You will prepare a calculation of their carbon footprint using:
https://www.carbonfootprint.com/calculator.aspx
You will be organized into groups and will participate in a student led online discussions using Zoom which will include student introductions, measuring and comparing carbon personal footprints, critical discussion around carbon footprints and also reflections on central issues related to this course. Students will submit a 300 word reflection on the exercise

Part 2: Discussion of 1.5 C lifestyles (20%)

Similar to the carbon footprint calculator, this part of the assignment is more technically challenging and will involve a discussion and critical reflection of how best to achieve a 1.5C lifestyle as rapidly as possible. The exercise will focus on nutrition, mobility, sports and leisure, housing and consumer goods. The aim is not to just think about individual impacts but to think about how communities, cities or society in general would have to change to achieve the 1.5C lifestyle. In order to help structure the discussions it may be helpful to list up potential barriers and opportunities to the achievement of these emissions reductions for one of the above areas of focus. In preparation for this discussion you are to read through and make notes on this document, In particular p.11: https://pub.iges.or.jp/pub/15-degrees-lifestyles-2019. Students will submit a 300 word reflection on the exercise.

Assignment 3: Critically evaluating climate mitigation and adaptation (30%)

The objective of this assignment is for students to make a pecha-kucha presentation (20 slides, 20 seconds per slide) on the theme of climate mitigation or adaptation in a specific geographic location (city, region, country) or for a specific sector (fashion, food, waste, energy, etc.).

You should record a narrated slideshow and share it with the course coordinator by email. The two best presentations will be shared during class. Assessment criteria for the presentations is as follows (equal allocation):

- Presentation that includes an introduction to the problem and logically follows through to a solution
- Suggested solution that responds to the climate crisis
- Evidence of the use of imagination and creativity in proposing the solution including a change in the way emissions are recorded
- Evidence of learning and expertise with the material to support the solution
- Timing, design and clarity of slides.

Assignment 4: Report on the evaluation of climate mitigation and adaption (20%)

You will submit a 1,000-word report based on the topic covered in your pecha-kucha presentation. Your report should focus on appropriate solutions and implementable mechanisms to achieve goals. You should review relevant government studies and planning documents that address climate change mitigation/adaptation (relevant to your topic) as well as academic peer-reviewed literature. In sum, the paper should include a pertinent literature review, background on the problem you are addressing and on outcomes, recommendations and conclusions, and bibliography. Regarding citations, please pick an accepted style based on the professional or academic skill you wish to gain, and *be consistent* (that is really my only requirement!). Examples include MLA, APA, and Chicago. The norm in the social sciences is APA.

This report will be evaluated based on the following criteria:

- Research: Has the student referenced quality academic source material in discussions?
- Issue Identification: Has the student identified and understood relevant issues, arguments and concepts?

- Analysis: Has the student provided insightful critical appraisal of issues covered and source material utilized, making connections and comparisons between ideas and issues, and adequately addressing alternative points of view?
- Argumentation: Is the student presenting a clearly structured argument with a logical progression to the discussion?

Class Readings and Films:

Session 1: Course Introduction and Overview/ Climate Science & Expected Impacts

State of the Climate in 2019, Special Supplement to the Bulletin of the American Meteorological Society, Vol.101, No.8, August 2020: https://www.dropbox.com/s/nwt68m6jgjebanr/2020bamsstateoftheclimate.pdf?dl=0

IPCC (2018). Special Report. Global Warming of 1.5 degrees C. Summary for Policymakers. Available at: https://www.ipcc.ch/sr15/chapter/spm/

Keener et al. (2012). Climate Change and Pacific Islands: Indicators and Impacts. Executive Summary. Available at: http://www.cakex.org/sites/default/files/documents/Exec-Summary-PIRCA-FINAL2.pdf

Film: An Inconvenient Truth (2006).
(Available in many places including Amazon Prime.)

Session 2: Student Breakout Groups

Class Discussion Assignment: Carbon Footprint!

Session 3: Australian Bushfires

Impact of Australia's catastrophic 2019/20 bushfire season on communities and environment: Retrospective analysis and current trends, Filkov et al. 2020, Journal of Safety Science and Resilience: Available at: https://www.dropbox.com/s/yu5h11da0x9oy9c/1-s2.0-S2666449620300098-main.pdf?dl=0

Session 4: Student Breakout Session

Class Discussion Assignment: 1.5 Degree Lifestyles, read: https://www.iges.or.jp/en/pub/15-degrees-lifestyles-2019/en

Session 5: Climate Change, Sea Level Rise and Coastal Cities/Coral Reefs

Film: Chasing Coral (2017). Available on Netflix (there is a 30-day free trial available).
https://www.chasingcoral.com

Hawaii Sea Leve Rise Vulnerability and Adaptation Report: https://climateadaptation.hawaii.gov/wp-content/uploads/2017/12/SLR-Report_Dec2017.pdf

Hino, M., Field, C. B., and Mach, K. J. (2017). Managed retreat as a response to natural hazard risk. *Nature Climate Change*, *7*(5), 364.

Dedekorkut-Howes, A., Torabi, E., and Howes, M. (2020). When the Tide Gets High: A Review of Adaptive Responses to Sea Level Rise and Coastal Flooding. Journal of Environmental Planning and Management.

Session 6: Accelerating Decarbonisation

A roadmap for rapid decarbonization, Rockstrom et al (2017) Science 355, 6331.
https://www.dropbox.com/s/4ydd01eiq247r69/1269.full.pdf?dl=0

Session 7: IPCC – History and Current Science

IPCC AR6 Synthesis Report: Climate Change 2021. Summary for Policymakers. Available at:
https://www.ipcc.ch/assessment-report/ar6/

Film: Chasing Ice (2012). Available on Amazon Prime. https://chasingice.com

Session 8: Renewable Energy in Samoa

Betzold, Carola (2015). Adapting to Climate Change in Small Island Developing States. *Climate Change*, 133: 481-489.

McNamara, K., Clissold, R., Wetoby, R., Piggott-McKellar, A., Kumar, Ro., Clarke, T., Namouou, F., Areki, F., Joseph, E., Warrick, O., Nunn, P. (2020). An Assessment of Community-Based Adaptation Initiatives in the Pacific Islands. Nature Climate Change, Vol. 10, 628-639.

Film: Before the Flood (2016). Available on Amazon Prime. https://www.beforetheflood.com

Session 9: Carbon Neutral Hawai'i by 2045

Coffman, M., Bernstein, P., Wee, S. (2016). "Integrating Electric Vehicles and Residential Solar PV," *Transport Policy*, 53: 30-38.

Coffman, M., Wee, S., Bonham, C., and Salim, G. (2015). "A Policy Analysis of Hawaii's Solar Tax Credit Incentive," *Renewable Energy*, 85: 2036-1043.

Session 10: Net Zero Carbon Japan and 100% Renewable

Kuramochi, T. (2015). Review of Energy and Climate Policy Developments in Japan before and after Fukushima. *Renewable and Sustainable Energy Reviews* 43, 1320-1332.

Session 11: Student Presentations

Session 12: Climate Change and Asian Cities

Readings TBD

Session 13 Carbon Divestment and Stranded Assets

Readings TBD

Film: The Age of Stupid (2009) available on Amazon Prime.
Age of Stupid (10th Anniversary Mini-Sequel) on YouTube (https://youtu.be/DcluMvn8ZAI)

Session 14: Food and Climate Climate Change

Readings TBD

Session 15: Student Discussions

Readings TBD