TAERE 2019 Summer School
Environmental Footprints
台灣環境與資源經濟學會 2019 暑期課程
環境足跡

July 15-16, 2019
Venue: Institute of Economics, Academia Sinica, Taipei, Taiwan
Organizers: Taiwan Association of Environmental and Resource Economics
Institute of Economics, Academia Sinica
Center for Global Change and Sustainability Science, National Taipei University
College of Management, National Chiao Tung University
School of Forestry and Resources Conservation, National Taiwan University
Taiwan Association for Low Carbon Society an Economy

07 月 15 日（星期一）/ July 15, 2019	
時間(Time)	**議程(Program)**
08:30~08:50	**報到 Registration**
08:50~09:00	**開幕致詞 Opening Remarks** • **簡錦漢** 中央研究院經濟研究所所長 **Kamhon Kan**, Director, Institute of Economics, Academia Sinica • **蕭代基** 台灣環境與資源經濟學會理事長 **Daigee Shaw**, President, Taiwan Association of Environmental and Resource Economics
09:00~10:30	**講師/ Instructors:** **Professor Jiří Jaromír KLEMEŠ**, Brno University of Technology, Czech Republic **Professor Petar Sabev Varbanov**, Brno University of Technology, Czech Republic • **Introduction to environmental impacts and interactions, foundations of Circular Economy** ➢ Introduction – main issues and problems of pollution and resource depletion ➢ Natural resources and their natural storages – circularity of extraction, use, and discharge ➢ Circular Economy principles and strategy ➢ Global energy and (virtual) water flows – the scale of the flows and the problems ➢ Sustainability – definition, components, and metrics ➢ Life Cycle thinking and the LCA framework ➢ The Environmental Performance Strategy Map ➢ Direct, indirect and total effects ➢ Measuring environmental sustainability
10:30~11:00 Coffee break 休息	
11:00~12:30	
12:30~14:00	**Lunch & Discussion**
14:00~15:30	**講師/ Instructors:** **Professor Jiří Jaromír KLEMEŠ**, Brno University of Technology, Czech Republic **Professor Petar Sabev Varbanov**, Brno University of Technology, Czech Republic • **Environmental Footprints – Introduction, definitions, implementation** ➢ General footprint principles and concepts ➢ GHG (Carbon) footprint ➢ Water footprint ➢ Energy footprint ➢ Nitrogen footprint ➢ Ecological footprint ➢ Other footprints ➢ Virtual footprints ➢ Measures and degrees of freedom to reduce footprints – resource saving via the resource/waste hierarchy, renewables, CO_2/carbon sequestration
15:30~16:00 Coffee break 休息	
16:00~17:30	
17:30~19:00	**Dinner**
07 月 16 日（星期二）/ July 16, 2019	
08:40~09:00	**報到 Registration**
09:00~10:30	**講師/ Instructors:** **Professor Jiří Jaromír KLEMEŠ**, Brno University of Technology, Czech Republic **Professor Petar Sabev Varbanov**, Brno University of Technology, Czech Republic • **Methods for Energy Saving and GHG/Haze Footprint Minimisation** ➢ Examples and case studies ➢ Introduction to Heat Integration and Pinch Analysis
10:30~11:00 Coffee break 休息	

11:00~12:30	➢ Advanced Process Integration Techniques – Heat Transfer Intensification, Locally-Integrated Energy Systems, integration of renewable energy sources, process-specific heat transfer properties in Total Site Heat Integration, accounting for preheating in steam generation, Power Pinch Analysis ➢ Energy storage for handling supply and demand variations ➢ GHG and Haze Footprint Minimisation
12:30~14:00	**Lunch & Discussion**
14:00~15:30	**講師/ Instructors:** **Professor Jiří Jaromír KLEMEŠ,** Brno University of Technology, Czech Republic **Professor Petar Sabev Varbanov,** Brno University of Technology, Czech Republic
15:30~16:00 Coffee break 休息	• **Methods for Reduction of Water Footprint, Water-Energy-GHG Nexus** ➢ Data extraction for Water Integration ➢ Water network design using Water Pinch Analysis ➢ Design for Maximum Water Reuse for Single Contaminant ➢ Source/Sink Composite Curves ➢ Significance of the Water Pinch ➢ Water network design/retrofit (Cost Effective Minimum Water Network) ➢ Reversal of the WEN – using it as a synergy mechanism
16:00~17:30	

※ The timetable is subject to minor changes. 課程時間可能會視情況而微調。