

## PROFESSOR ŞİİR KILKIŞ, IPCC WGIII VICE-CHAIR NOMINEE FOR AR7

### SUMMARY OF ACADEMIC AND RESEARCH PROFILE

**Professor Şiir Kilkış has conducted pioneering scientific research focused on climate change and sustainability over the last 20 years continuously at renowned international universities and research institutions.** She holds a Gold Medal in Science, Technology and International Affairs from Georgetown University and conducted her doctoral studies at the KTH Royal Institute of Technology. She is a Senior Researcher and Science Advisor to the President at the Scientific and Technological Research Council of Türkiye. During the Sixth Assessment Cycle (AR6), she served actively as an IPCC Lead Author in Working Group III (WGIII), including multiple cross-chapter and cross-Working Group collaborations. She continues to mobilise her transdisciplinary academic and research experiences across continents, including those for urban systems.



### SERVICE TO THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)

After multiple years of strenuous work involving systematic assessments, the production of policy-relevant knowledge, and collaborative interaction, IPCC Lead Author Şiir Kilkış has been on the Core Author Team of the Summary for Policymakers (SPM) of WGIII and **engaged actively in supporting numerous cross-chapter and cross-Working Group efforts.** As a member of the IPCC Steering Committee for the Diversity, Equity and Inclusion Survey formed with a mandate of the Gender Action Team, she continues to work towards supporting the applicability of this seamless process for other scientists across the world. These experiences reflect over to her main priorities as an IPCC Working Group III Vice-Chair nominee.

### Lead Author, Sixth Assessment Report (AR6)

*Intergovernmental Panel on Climate Change (IPCC)* [01/02/2018 – 20/03/2023]

- **Core Author Team**, Summary for Policymakers Climate Change 2022: Mitigation of Climate Change
- **Lead Author**, Technical Summary of Climate Change 2022: Mitigation of Climate Change
- **Lead Author**, Urban Systems and Other Settlements (Chapter 8)
- Working strenuously on a continuous basis with time-bound milestones beyond Lead Author meetings
- Establishing the first-time chapter on “urban systems” with a key role in the mitigation of climate change

### Cross-Working Group (WG) & Cross-Chapter Collaborations

- **Co-Lead**, Cross-Working Group Initiative on “Cities and Climate Change” (WGII-III)
- Theme of Shifting Development Pathways Towards Sustainability (Chapter 4)
- Synergies and Trade-offs Between Sectoral Mitigation Options and the Sustainable Development Goals (Chapter 17)
- Methodology for Assessing the Feasibility of Mitigation Response Options
- Illustrative Mitigation Pathways (IMPs) Storylines Sub-Group (Chapter 3)
- COVID-19 Crisis: Lessons, Risks and Opportunities for Mitigation
- Introduction and Framing (Chapter 1)
- Case Studies of Integrated Policymaking for Sector Transitions
- National and Sub-national Policies and Institutions (Chapter 13)
- Transition Dynamics and Socio-Technical Transition Processes
- Digitalization: Efficiency Potentials and Governance Considerations
- Innovation, Technology Development and Transfer (Chapter 16)
- Supplementary Material Multi-Dimensional Feasibility Assessment and SDGs
- Climate Fact Sheets for Sectors based on Climatic Impact-Drivers (WGI)
- IPCC Interactive Atlas Joint Session Among Working Groups (WGI)

## IPCC Steering Committee on the Diversity, Equity, and Inclusion Survey

[IPCC Secretariat / Geneva, Switzerland, 01/01/2023 – Current]

- Working together to identify areas of strength and opportunities to improve representation

## IPCC Workshop on the Use of Scenarios in AR6 and Subsequent Assessments

[UNESCAP Conference Centre / Bangkok, Thailand, 25/04/2023 – 27/04/2023]

### UNIVERSITY EDUCATION AND FELLOWSHIPS

At Georgetown University, Şiir Kılış focused on climate change and sustainability, was a John Carroll Research Fellow, and graduated magna cum laude and with honours from Science, Technology and International Affairs – a unique interdisciplinary program focused on applying cutting-edge science to the world's most pressing challenges. At KTH Royal Institute of Technology, she developed a new model (the Rational Exergy Management Model) to curb CO<sub>2</sub> emissions in the exergy-aware built environments of the future. Her doctoral studies provided guidance for net-zero targets, including pilot districts in Sweden and China. These educational milestones have equipped her with a **transdisciplinary research profile**.

### Doctor of Philosophy (PhD)

**KTH Royal Institute of Technology** [15/01/2008 – 08/12/2011]

School of Architecture and the Built Environment (ABE), Stockholm (Sweden)

Civil and Architectural Engineering, Specialization in Building Technology

**Graduate Researcher** School of Public Policy, Georgetown University [08/08/2007 – 15/12/2007]

### Bachelor of Science (B.S.) with Honors and Magna cum Laude

**Georgetown University (GU)** [01/08/2003 – 19/05/2007]

Washington, D.C. (United States)

Science, Technology and International Affairs (STIA)

**John Carroll Research Fellow** Georgetown University (GU) [15/08/2004 – 19/05/2007]

### HONOURS AND AWARDS

The Massachusetts Institute of Technology Lincoln Laboratory awarded a Minor Planet Award for her studies as a young researcher. Later, she received the Gold Medal in Science, Technology and International Affairs (STIA) from Georgetown University. She holds **other prestigious awards for her research work**, including a Mustafa Parlar research award for her studies in climate change and an award from the Science Academy affiliated with the International Science Council (ISC) for her studies in environmental science and engineering. She is a candidate for an Outstanding Researcher Award and research fellowship. Awards given collectively to author teams and a Mission Team are as indicated (\*).

### Gold Medal in Science, Technology and International Affairs (STIA)

**Georgetown University** [17/05/2007]

- Top honors graduate addressing global challenges with pioneering interdisciplinary approaches

**Science Academy Research Fellowship**, Studies in Environmental Science and Engineering

- From the Science Academy affiliated with the International Science Council [08/04/2023 – Current]

**Research Incentive Award**, Studies in Climate Change and Atmospheric Sciences

Mustafa Parlar Education and Research Foundation [03/03/2023]

### **Minor Planet Award for Young Scientist**

Massachusetts Institute of Technology (MIT) Lincoln Laboratory [05/2002]

**Eva C. Kirkpatrick Science Award**, Missouri Academy of Science [2002]

**Sustainable Development Goals (SDG) Vanguard Award to IPCC**, Collective Award \*

United Nations Foundation [08/12/2021]

**Gulbenkian Prize for Humanity to IPCC and IPBES**, Collective Prize \*

Calouste Gulbenkian Foundation [13/10/2022]

**JRC Science Summit Excellence Award to Mission Team**, Collective Award \*

European Union Joint Research Centre [15/06/2022]

**Young Researcher Award**, Sustainable Aviation Research Society [2016]

## **PROFESSIONAL WORK AND CAREER EXPERIENCE**

Mobilising her transdisciplinary academic and research profile, Kılış undertakes pioneering work at **The Scientific and Technological Research Council of Türkiye (TÜBİTAK)** as a leading research institution, where she continues to be Senior Researcher. She is also a Science Advisor to the President of the Council, extending her independent scientific expertise to science-based approaches and action.

In her university positions, she has undertaken and continues to undertake innovative pedagogical approaches, including in the **Earth System Science Program of the top research university in the country**, namely Middle East Technical University (METU) in Ankara. For the last 6 years, she has been (Assoc.) Professor in Energy Systems Engineering, Climate Change, and Sustainable Development.

She has been engaged in the science-policy interface directly in the field since her early professional career experience at the **World Resources Institute (WRI)** in preparation for the then 15<sup>th</sup> Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC).

### **Senior Researcher**

**Scientific and Technological Research Council of Türkiye (TUBITAK)** [18/04/2017 – Current]

- Researching effective climate mitigation pathways and transitions for sustainable urban systems
- Developing co-creation based collaboration approaches for climate neutrality and net-zero targets
- **Senior Expertise:** Mission-oriented approaches for sustainable urban systems and sustainability

### **Science Advisor to the President**

**Scientific and Technological Research Council of Türkiye (TUBITAK)** [26/08/2019 – Current]

- Informing on climate science and transdisciplinary research for sustainable development
- Providing science-based guidance for climate change and establishment of new approaches
- Supporting and coordinating new research infrastructure on climate change and sustainability

### **Associate Professor / Climate Change and Sustainability Development**

**Earth System Science Program, Graduate School of Natural and Applied Sciences METU**

[07/04/2017 – Current]

- Implementing innovative pedagogical approaches in the fields of climate change and sustainability

### **Associate Professor / Energy Systems Engineering**

*Energy Engineering, Faculty of Science, Başkent University* [07/04/2017 – 24/01/2018]

### **Academic Instructor / Earth System Science**

*Earth System Science Program, Graduate School of Natural and Applied Sciences METU*  
[22/09/2014 – 07/04/2017]

### **Academic Instructor / Energy Systems Engineering**

*Energy Engineering, Faculty of Science, Başkent University* [14/02/2012 – 07/04/2017]

### **Scientific Expert**

*The Scientific and Technological Research Council of Türkiye (TUBITAK)* [12/06/2012 – 18/04/2017]

- Developing national/international strategies for research, development (R&D) and innovation policy
  - Leading official R&D and innovation study visits to institutions in Singapore, China, Brazil and India
- Expertise:** Sustainability-oriented innovation systems and transition management for sustainability

### **Assistant Expert**

*The Scientific and Technological Research Council of Türkiye (TUBITAK)* [08/07/2008 – 12/06/2012]

- Developing roadmaps in energy and environment focusing on green transition management

### **Global Climate Change Intern for UNFCCC COP15**

*World Resources Institute (WRI)* [23/09/2007 – 23/02/2008]

## **INTERNATIONAL NETWORKS AND MEMBERSHIPS**

Şiir Kılış **is a member of international scientific networks**, including as a member of the International Centre for Sustainable Development of Energy, Water, and Environment Systems (SDEWES), the Earth Commission for a safe and just corridor, and the Future Earth Urban Knowledge-Action Network. More recently, she is selected to support the Mission Board on Climate-Neutral Cities and is a non-member participant in the Board of Governors of the Joint Research Centre (JRC) of the European Commission.

**Member, International Scientific Committee of the International Centre for Sustainable Development of Energy, Water and Environment Systems** [14/09/2015 – Current]

### **Member, Earth Commission Working Group 5 on Translation and Methods**

[Future Earth (Stockholm) in Collaboration with PIK and IIASA, 01/07/2020 – Current]

- Developing principles and approaches for a safe and just corridor, including for local actors

### **Member, Expert Group: Mission Board for Climate-Neutral and Smart Cities Mission**

[European Commission (Brussels), 06/09/2022 – Current]

- Selected as a member to guide 112 Mission Cities to climate neutrality by the year 2030

### **Participant, Board of Governors, European Commission Joint Research Centre (JRC)**

[26/11/2021 – Current]

### **Member, Steering Committee, Belmont Forum**

[01/01/2022 – Current]

### **Co-Lead, Earth Commission Working Group 5 Cities Workstream**

[Future Earth (Stockholm) in Collaboration with PIK and IIASA, 02/03/2021 – Current]

### **Member, Steering Committee, Future Earth Urban Knowledge-Action Network (KAN)**

[07/07/2019 – Current]

- Developing research priorities and implementation plan for sustainable, livable urban systems

## **APPOINTMENTS AND RELEVANT RESPONSIBILITIES**

Beyond the scope of the Intergovernmental Panel on Climate Change, Şiir Kılış has provided support to the Technical Dialogues of the first Global Stocktake at the UN Climate Change Conference. Among her other appointments, she has been an expert for the JRC and held official duties in commissions, including as Working Group Chair on **Impacts of Climate Change on Sustainable Development** in her country.

### **Expert, UNFCCC Technical Dialogues of the First Global Stocktake**

[Sharm El Sheikh, Egypt, 06/11/2022 – 12/11/2022]

- Appointed among Lead Authors to facilitate interactive exchanges on transforming urban systems

### **Expert, UNFCCC Conference of Parties (COP27) High-Level Side Events**

[Sharm El Sheikh, Egypt, 06/11/2022 – 18/11/2022]

- IPCC Lead Author in the Summary for Urban Policymakers (SUMP) launched at COP27
- Mitigation of Climate Change presentation and Science for Climate Action Pavilion discussions

### **Expert Reviewer, Sixth Assessment Report of the IPCC** [02/08/2017 – 20/03/2022]

- Synthesis Report; Climate Change 2021: Physical Science Basis; Climate Change 2022: Impacts, Adaptation and Vulnerability, Special Reports on Global Warming of 1.5 °C & Climate Change and Land

### **Expert, European Commission Joint Research Centre (JRC)** [16/08/2021 – 30/09/2022]

- Supporting the preparation of an Info Kit for Mission Cities with a focus on systemic approaches

### **Commission Member, Impacts of Climate Change on Sustainable Development**

[Presidency of Strategy and Budget / Ankara, Türkiye, 09/12/2022 – 31/01/2023]

### **Working Group Chair, Impacts of Climate Change on Sustainable Development**

[Presidency of Strategy and Budget / Ankara, Türkiye, 09/12/2022 – 31/01/2023]

### **Moderator, Climate Summit of Türkiye Science and Technology Commission**

[Ministry of Environment, Urbanisation and Climate Change / Ankara, Türkiye, 10/01/2022 - 25/02/2022]

### **Young Leader, STS Forum Dialogue between Young Leaders and Nobel Laureates**

[Science and Technology in Society (STS) Forum / Kyoto, Japan, 03/10/2020 – 06/10/2020]

### **Expert, How Basic Sciences Support Sustainable Development and Future Potential**

[First ANSO Young Scientists Forum / Hangzhou, China, 09/11/2019 – 12/11/2019]

### **Author, Annex 64 – Optimised Performance of Energy Supply Systems with Exergy Principles** [IEA Energy in Buildings and Communities Programme, 01/04/2015 – 01/09/2019]

### **Lead, The Scientific and Technological Research Council of Türkiye (TÜBİTAK)**

- R&D and innovation study visits to Singapore, China, India and Brazil [between 2013 and 2014]

## INVITED LECTURES AND RECENT PRESENTATIONS

Her international research work has led to her being invited to give **plenary lectures and speeches in Asia, Africa, Europe, and North America**. The most recent examples involve lectures on modeling advances, urban scenarios, net-zero carbon cities, and climate change mitigation more broadly. She has provided international presentations extensively since 2006 with recent examples including those that are given at the Scenarios Forum, Yale University, Conferences on Sustainable Development of Energy, Water and Environment Systems, UN-Habitat, and the Sustainability Research and Innovation Congress.

### **Effective Mitigation of Climate Change: Modelling Advances and Priorities for AR7**

[05/09/2022]

- Invited Lecture presentation focusing on advances and priorities for the next Assessment Cycle
- Theme: Low-Carbon Society: Enhanced Modelling for the Transition to Sustainability
- Next-Generation Within Limits Integrated Assessment Model Summer School, **Dubrovnik, Croatia**

### **Urban Emissions Scenarios: Advances and Ways Forward in the SSP-RCP Framework**

[20/06/2022]

- Forum on Scenarios for Climate and Societal Futures (Scenarios Forum) Presentation
- International Institute for Applied Systems Analysis (IIASA) **Laxenburg, Austria**

### **Net-Zero Carbon Cities and Electrification: The Next Global Agenda** [23/09/2022]

- Invited Speaker at 9<sup>th</sup> Annual Hixon Center Urban Conference, Yale University, **New Haven, Connecticut**, “Cities as Solutions to Climate Change: Perspectives from IPCC Authors”

### **Navigating the Opportunities for Sustainable Cities** [23/06/2022]

- Plenary on Sustainable Cities: Navigating the Urban Nexus (Online Plenary Speaker)
- Sustainability Research and Innovation Congress (SRI2022), **Pretoria, South Africa**

### **Urban Science for Acceleration of Global Urban Sustainability Transformations**

[21/06/2022]

- Invited Speaker at the Virtual Session of the Future Earth Urban Knowledge-Action Network (UKAN)
- Sustainability Research and Innovation Congress (SRI2022), **Pretoria, South Africa**

### **Mitigation of Climate Change – Urban Action and Energy Perspectives** [09/06/2022]

- Implications of the 2022 IPCC Working Group III Report Webinar, **UNDP and UN-Habitat**

### **Mitigation of Climate Change with System Transformations and Integrated Approaches**

[23/05/2022], Opening Ceremony, 5<sup>th</sup> South East European Conference on SDEWES, **Vlore, Albania**

### **Integrated Urban Emissions and LUE Scenarios with Comparisons to Mission Cities**

[25/06/2022], 5<sup>th</sup> South East European Conference on SDEWES Session on Urbanism, **Vlore, Albania**

### **Combined Scenario Framework for Sustainable Urban Systems Pathways and Perspectives for São Paulo**

[25/07/2022], 3<sup>rd</sup> Latin American Conference on SDEWES (Virtual Session), **São Paulo, Brazil**

### **Enabling Pathways towards Sustainable Urban System Scenarios for Effective Climate Mitigation** [14/09/2021],

- Invited Plenary Lecture at the 16<sup>th</sup> Conference on SDEWES, **Dubrovnik, Croatia**

### **Integrated Approach for Climate Neutrality in Urban Areas with Correct Timing and Response** [03/09/2020]

- Climate Neutrality in Cities Panel (Virtual): 15<sup>th</sup> Conference on SDEWES, **Cologne, Germany**

## Key Findings for Sustainable Urban Planning to Adapt and Mitigate Climate Change

[11/11/2022]

- Decarbonization Day – Accelerating Science-Based Green Transition Panel, **Sharm El Sheikh, Egypt**

## Findings from IPCC and the Role of Urban Areas in Energy Storage & Saving [21/10/2022]

- Invited Keynote at the 1<sup>st</sup> International Conference on Energy Storage and Saving, **Xi'an, China**

## Transforming Education and HEI for a Climate-Neutral Future [18/11/2022]

- Invited Presentation, International USR Summit Session of the University Alliance of Silk Road (**Virtual**)

## Benchmarking the Sustainability of Urban Energy, Water and Environment Systems with the SDEWES City Index and Envisioning Scenarios for the Future [08/09/2017]

- Invited Plenary Lecture at the 12<sup>th</sup> Conference on SDEWES, **Dubrovnik, Croatia**

### SELECTED PEER-REVIEWED SCIENTIFIC PUBLICATIONS

She is a top 2% researcher in the fields of **energy, environmental sciences, and enabling/strategic technologies** based on the Elsevier / Stanford University author databases of standardized citation indicators for consecutive years. Her newest landmark scientific publications establish and compare SSP-RCP climate scenarios for 420 cities for the first time, including land use efficiency (LUE) scenarios. Her top-cited scientific publications involve the development and application of a multi-dimensional index now benchmarking 120 cities worldwide, a pilot net-zero exergy district, an energy-water-food-education nexus, as well as advances in sustainable development of energy, water and environment systems. Her main research focus is on climate change and urban systems, also including feasibility and governance.

Key Metrics	Web of Science	Scopus	Google Scholar	ResearchGate
• Publications	48	49	112	75
• Citations	912	1085	1799	1339
• h-Index	19	20	25	22

Web of Science: [E-5934-2015](#) Scopus Author ID: [23094010000](#) ORCID: [0000-0003-3466-3593](#)

### SSP-RCP Emissions Scenarios and Pathways

- Gurney, K., **Kilkis, Ş.**, Seto, K., Lwasa, S., Moran, D., Riahi, K., Keller, M., Rayner, P., Luqman, M. 2022. Greenhouse gas emissions from global cities under SSP/RCP scenarios, 1990 to 2100, *Global Environmental Change* 73: 102478 <<https://doi.org/10.1016/j.gloenvcha.2022.102478>>.
- **Kilkis, Ş.** 2022. Urban emissions and urban land use efficiency scenarios towards effective climate mitigation in urban systems, *Renewable and Sustainable Energy Reviews* 167: 112733 <<https://doi.org/10.1016/j.rser.2022.112733>>.

### Benchmarking Sustainable Urban Systems

- **Kilkis, Ş.** 2021. Transition towards urban system integration and benchmarking of an urban area to accelerate mitigation towards net-zero targets, *Energy* 236: 121394.
- **Kilkis, Ş.** 2019. Benchmarking the sustainability of urban energy, water and environment systems and envisioning a cross-sectoral scenario for the future, *Renewable and Sustainable Energy Reviews* 103: 529-545.
- **Kilkis, Ş.** 2019. Data on cities that are benchmarked with the sustainable development of energy, water and environment systems index and related cross-sectoral scenario, *Data in Brief* 24: 103856.
- **Kilkis, Ş.** 2018. Application of the Sustainable Development of Energy, Water and Environment Systems Index to World Cities with a Normative Scenario for Rio de Janeiro, *J. Sustainable Dev. Energy, Water, Environ. Systems* 6(3): 559-608.

- **Kılıç, Ş.** 2018. Sustainable Development of Energy, Water and Environment Systems Index for Policy Learning in Cities, *Int. J. of Innovation and Sustainable Development* 12(1/2): 87-134.
- **Kılıç, Ş.** 2018. Benchmarking South East European Cities with the Sustainable Development of Energy, Water and Environment Systems Index, *J. Sustainable Dev. Energy, Water, Environ. Systems* 6(1): 162-209.
- **Kılıç, Ş.** 2016. Sustainable development of energy, water and environment systems index for Southeast European cities, *J. Cleaner Prod.* 130: 222-234.
- **Kılıç, Ş.** 2015. Composite index for benchmarking local energy systems of Mediterranean port cities, *Energy* 92 (3): 622-638.

### Multi-Dimensional Feasibility and Governance

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- Steg, L., Veldstra, J., de Kleijne, K., **Kılıç, Ş.** et al. 2022. A method to identify barriers to and enablers of implementing climate change mitigation options, *One Earth* 5(11): 1216-1227.
- Bai, X., Björn, A., **Kılıç, Ş.** et al. 2022. How to stop cities and companies causing planetary harm, *Nature* 609, 463-466.
- Creutzig, F., Acemoglu, D., Bai, X., Edwards, P., Hintz, M., Kaack, L., **Kılıç, Ş.** et al. 2022. Digitalization and the Anthropocene, *Annual Review of Environment and Resources* 47:479-509.
- **Kılıç, Ş.**, Wang, C., Björk, F., Martinac, I. 2017. Cleaner energy scenarios for building clusters in campus areas based on the Rational Exergy Management Model, *J. Cleaner Prod.* 155: 72-82.
- **Kılıç, Ş.** 2017. Comparative analyses of sustainable campuses as living laboratories for managing environmental quality, *Management of Environmental Quality* 28(5): 681-702.
- **Kılıç, Ş.** 2016. Sustainability oriented innovation system analyses of Brazil, Russia, India, China, South Africa, Türkiye and Singapore, *J. Cleaner Prod.* 130: 235-247.

### Urban Planning and Energy Systems Analysis

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- **Kılıç, Ş.**, Kılıç, B. 2019. An urbanization algorithm for districts with minimized emissions based on urban planning and embodied energy towards net-zero exergy targets, *Energy* 179:392-406.
- Kılıç, B., **Kılıç, Ş.** 2018. Hydrogen Economy Model for Nearly Net-Zero Cities with Exergy Rationale and Energy-Water Nexus, *Energies* 11(5): 1226.
- **Kılıç, Ş.** 2017. A Nearly Net-Zero Exergy District as a Model for Smart Energy Systems in the Context of Urban Metabolism, *J. Sustainable Dev. Energy, Water, Environ. Systems* 5(1): 101-126.
- **Kılıç, Ş.** 2015. Exergy transition planning for net-zero districts, *Energy* 92 (3): 515-531.
- **Kılıç, Ş.** 2014. Energy system analysis of a pilot net-zero exergy district, *Energy Conversion and Management* 87: 1077-1092.

### Climate Change Mitigation and Climate Neutrality

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- **Kılıç, Ş.**, Krajačić, G., Duić, N., Rosen, M., Al-Nimr, M. 2022. Effective mitigation of climate change with sustainable development of energy, water and environment systems, *Energy Conversion and Management* 269: 116146.
- **Kılıç, Ş.**, Krajačić, G., Duić, N., Rosen, M., Al-Nimr, M. 2021. Accelerating mitigation of climate change with sustainable development of energy, water and environment systems, *Energy Conversion and Management* 245: 114606.
- **Kılıç, Ş.**, Krajačić, G., Duić, N., Rosen, M., Al-Nimr, M. 2020. Advances in integration of energy, water and environment systems towards climate neutrality for sustainable development, *Energy Conversion and Management* 225: 113410.
- **Kılıç, Ş.**, Krajačić, G., Duić, N., Montorsi, L., Wang, Q., Rosen, M., Al-Nimr, M. 2019. Research frontiers in sustainable development of energy, water and environment systems in a time of climate crisis, *Energy Conversion and Management* 199: 111938.
- **Kılıç, Ş.**, Krajačić, G., Duić, N., Al-Nimr, M. 2018. Advancements in sustainable development of energy, water and environment systems, *Energy Conversion and Management* 176, 164-183.



Most Cited Top 5 Peer-Reviewed Scientific Publications	Scopus	WoS
• <b>Kilkış Ş.</b> (2016) Sustainable Development of Energy, Water and Environment Systems Index for Southeast European cities, <i>Journal of Cleaner Production</i> 130: 222-234, doi: 10.1016/j.jclepro.2015.07.121	108	91
• <b>Kilkış Ş.</b> (2014) Energy system analysis of a pilot net-zero exergy district, <i>Energy Conversion and Management</i> 87: 1077-1092, doi: 10.1016/j.enconman.2014.05.014	66	59
• <b>Kilkış Ş.</b> , Kilkış B. (2017) Integrated circular economy and education model to address aspects of an energy-water-food nexus in a dairy facility and local contexts, <i>Journal of Cleaner Production</i> 167: 1084-1098, doi: 10.1016/j.jclepro.2017.03.178	60	53
• <b>Kilkış Ş.</b> , Krajačić G., Duić N., Rosen M.A., Al-Nimr M.A. (2018) Advancements in sustainable development of energy, water and environment systems, <i>Energy Conversion and Management</i> 176: 164-183, doi: 10.1016/j.enconman.2018.09.015	55	49
• Kilkış Ş., <b>Kilkış Ş.</b> (2016) Benchmarking airports based on a sustainability ranking index, <i>Journal of Cleaner Production</i> 130: 248-259, doi: 10.1016/j.jclepro.2015.09.031	54	51

### BOOK AUTHORSHIPS AND CHAPTERS

Her authorship extends to those published by Springer Nature, Elsevier, and others as well as an initiative to increase the accessibility of the IPCC's findings for **urban policymakers that is launched at COP27**.

- **IPCC (2022)**, Summary for Policymakers, In: *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 Univ. Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.001
- Lwasa, S., Seto, K.C., Bai, X., Blanco, H., Gurney, K.R., **Kilkış, Ş.**, Lucon, O., Murakami, J., Pan, J., Sharifi, A., Yamagata, Y. (2022), Urban systems and Other Settlements. 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 et al. (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.010
- Babiker, M., Bazaz, A., Bertoldi, P., Creutzig, F., De Coninck, H., De Kleijne, K., Dhakal, S., Haldar, S., Jiang, K., **Kilkış, 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 (IIHS). doi:10.24943/SUPSV310.2022
- Revi, A., Roberts, D., Klaus, I., Bazaz, A., Krishnaswamy, J., Singh, C., Eichel, A., Kodira, P. P., Seth, S., Adelekan, I., Babiker, M., Bertoldi, P., Cartwright, A., Chow, W., Colenbrander, S., Creutzig, F., Dawson, R., De Coninck, H., De Kleijne, K., Dhakal, S., Gallardo, L., Garschagen, M., Haasnoot, M., Haldar, S., Hamdi, R., Hashizume, M., Islam, A.K.M. S., Jiang, K., **Kilkış, S.**, Klimont, Z., Lemos, M. F., Ley, D., Lwasa, S., McPhearson, T., Niamir, L., Otto, F., Pathak, M., Pelling, M., Pinto, I., Pörtner, H-O., Pereira, J. P., Raghavan, K., Roy, J., Sara, L. M., Seto, K. C., Simpson, N. P., Solecki, W., Some, S., Sörensson, A. A., Steg, L., Szopa, S., Thomas, A., Trisos, C., Ürge-Vorsatz, D. (2022). The Summary for Urban Policymakers of the IPCC's Sixth Assessment Report. IIHS. doi:10.24943/SUPSV511.2022
- **Kilkış, Ş.** (2022), Tackling the Climate Emergency with Urban Sustainability Approaches, In: *Handbook of Sustainability Science in the Future*, W. Leal Filho et al. (Eds.), Springer Nature, Switzerland, doi:10.1007/978-3-030-68074-9\_58-1, p. 1-27.
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- **Kilkış, Ş.** (2020), Appendix 2: The SDEWES Index, In: *Transforming Our World: Necessary, Urgent, and Still Possible*, Šlaus, I. (Ed.), Cambridge Scholars, ISBN: 1-5275-4736-1, p.387-402.
- Kilkış, B., **Kilkış, Ş.** (2015), Combined Heat and Power with Renewable Energy Sources (Yenilenebilir Enerji Kaynakları ile Birleşik Isı ve Güç Üretimi), Doğa Yayıncılık, ISBN: 978-975-6263-25-9, p. 1-372.

- **Kilkis, Ş.** (2014), Green Cities and Compound Metrics Using Exergy Analysis, In: *Encyclopedia of Energy Engineering and Technology*, Anwar, S. (Ed.), CRC Press Taylor & Francis, ISBN: 9781351237734, p.1-7.
- **Kilkis, Ş.** (2011), A Rational Exergy Management Model to Curb CO<sub>2</sub> Emissions in the Exergy-Aware Built Environments of the Future, *Doctoral Thesis*, KTH Royal Institute of Technology, Stockholm: Sweden, URN: urn:nbn:se:kth:diva-42469, p. 1-200.

## OTHER PUBLICATIONS AND GUIDEBOOKS

Her other publications include a Guidebook for Sustainable Energy and Climate Action Plans (**SECAP**) that has since led to preparing an Info Kit for cities aiming to reach climate neutrality in a new Mission.

- Andreanidou, K., Bertoldi, P., Dallemand, J., Follador, M., Glancy, R., Hernandez Gonzalez, Y., Iancu, A., **Kilkis, Ş.**, Kona, A., Labanca, N., Lah, O., Marinho Ferreira Barbosa, P., Melica, G., Monni, S., Muntean, M., Palermo, V., Ribeiro Serrenho, T., Rivas Calvete, S., Zancanella, P. and Zangheri, P. (2018), Guidebook: *How to develop a Sustainable Energy and Climate Action Plan (SECAP)*, EUR 29412 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-79-96848-8.
- **Annex 64** (2019), LowEx Communities – Optimised Performance of Energy Supply Systems with Exergy Principles (Annex 64) Final Report, Fraunhofer Verla, Stuttgart, ISBN: 978-3-8396-1518-8
- **Kilkis, Ş.**, Bjørn, A., Bai, X., Crona, B., Andersen, L., Whiteman, G., Liu, J., Hasan, S., Vijay, V., Sabag, O. 2023. Catalysing city-company collaborations to operate within Earth System boundaries, OSF Preprints <<https://osf.io/cw7ym>>.

## OTHER AWARDS FOR RESEARCH CONTRIBUTIONS

During the process of producing **relevant scientific research and publications**, she received additional awards, including Best Paper Awards from both an international centre as well as an academy of science.

### Best Paper Award

International Centre for Sustainable Development of Energy, Water and Environment Systems [2012]

**Best Paper Award**, Virginia Academy of Science [2004]

### Best Poster Awards

International Centre for Sustainable Development of Energy, Water and Environment Systems [2014/15]

### Most Cited JSDEWES Paper

International Centre for Sustainable Development of Energy, Water and Environment Systems [2020]

## EDITORIAL TASKS IN SCIENTIFIC JOURNALS

She takes place on the Editorial Board of international scientific journals and is a Guest Editor in *Energy Conversion and Management*. Beyond non-senior editorial tasks, she has more than 360 verified reviews in 50 journals and is a top reviewer in **cross-field, environment, ecology, energy and engineering**.

- **Member**, Editorial Board of *Energy Conversion and Management* (ECM), [15/02/2023-Current]
- **Member**, Editorial Board of *Energy Storage and Saving* (ENSS), [24/08/2021-Current]
- **Member**, Editorial Board of *Smart Energy* (SEGY), [23/06/2020-Current]
- **Member**, Editorial Board of the *Journal of SDEWES* (JSDEWES), [14/09/2015-Current]
- **Guest Editor**, Editorial Board of *Energy Conversion and Management* (ECM), [01/11/2017-Current]

## RECENT CLIMATE CHANGE AND SUSTAINABILITY OUTREACH

Since the launch of the landmark report on Climate Change 2022: Mitigation of Climate Change, Şiir Kılış has been active in giving **interviews both nationally and internationally**, including interviews and broadcasts through Anadolu Agency and TRT Radio, Carbon Brief, and Global Policy Lab: Living Cities.

### Broadcast Interview with Anadolu Agency

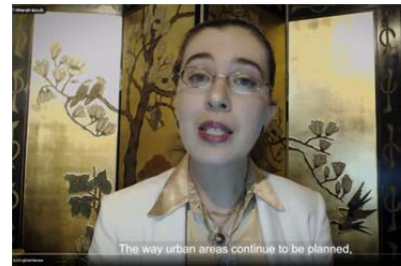
- “Net-sıfır sera gazı salımı hedeflerinde çözümün büyük parçası kentsel sistemlerde” (Turkish, translates to “Urban systems are a big part of the solution for net-zero GHG emissions targets”) [06/04/2022]

### National Radio Interview with TRT Radio

- 26-minute interview in the new national program “İklimin Geleceği” (Future of Climate) [13/05/2022]

### Media Interview Examples as an IPCC Author:

- “Scientists react: What are the key new insights from the IPCC’s WG3 report?” (Carbon Brief)
- “UN Report: Rethink cities to combat climate crisis” (Global Policy Lab: Living Cities of POLITICO)
- “Las ciudades presentan una gran oportunidad para la acción climática” (Spanish Press and others)



## OTHER CLIMATE CHANGE AND SUSTAINABILITY ACTIVITIES

Among other outreach, she has represented IPCC key findings in the Grand National Assembly of the Republic of Türkiye and worked to increase **climate change and sustainability education at all levels**. She also provides support to university initiatives for climate-aware and green campuses and has been active in special sessions in multiple continents, including those in South America, Europe and Australia.

### Climate Change and Sustainability, Representation of the IPCC key findings in high-level meetings

- Including the Presidential Science, Technology and Innovation Policies Council [18/08/2021] and others

### Climate-Aware Campus Initiatives, Presentations for the initiatives of TU Delft, KTH and METU

**Special Session Programming Committee**, 2<sup>nd</sup> Asia Pacific Conference on Sustainable Development of Energy, Water and Environment Systems, **Gold Coast, Australia** [2023-Current]

**Special Session Organizer**, Challenges and Solutions for More Sustainable Urban Systems: Perspectives from Latin American Cities and Beyond, 1<sup>st</sup> Latin American Conference on Sustainable Development of Energy, Water and Environment Systems, **Rio de Janeiro, Brazil** [2017-2018]

**Special Session Organizer**, Sustainable Campuses and Communities: Living Labs of Future Production & Consumption Systems, SDEWES Conferences, **Dubrovnik, Piran and Lisbon** [2015-2016]

## OTHER EXAMPLES OF INTERNATIONAL PRESENTATIONS

Şiir Kılıç has delivered **over 80 scientific presentations in international scientific conferences** based on her original research work, examples of which are shared below. This includes a presentation in the IPCC Cities and Climate Change Science Conference that was organised with the main purpose of inspiring research focused on providing the next frontiers for the science of cities and climate change.

### **SDEWES City Index towards Sustainable Urban Systems** [06/03/2018]

- IPCC Cities and Climate Change Science Conference, **Edmonton, Canada**

### **Benchmarking Sustainable Urban Systems at the Interface of the Landside and Seaside: Port Cities and Coastal Settlements on Islands** [04/10/2018]

- 13<sup>th</sup> Conference on SDEWES, **Palermo, Italy**

### **Application of the Sustainable Development of Energy, Water and Environment Systems City Index and Analysis of Opportunities for Rio de Janeiro** [30/10/2018]

- 1<sup>st</sup> Latin American Conference on SDEWES, **Rio de Janeiro, Brazil**

### **Application of a Benchmarking Index to Çankaya Municipality with Comparisons Based on Tiers of Urban System Integration** [03/07/2018]

- 3<sup>rd</sup> South East European Conference on SDEWES, **Novi Sad, Serbia**

### **Net-Zero District Trends: Case Study Östra Sala backe** [18/06/2015]

- EU Sustainable Energy Week (EUSEW), **Brussels, Belgium**

### **Spatial Data for University Campuses with Implications for a Net-Zero District** [25/11/2015]

- EULF Workshop on Spatial Data for Modelling Building Stock Energy Needs, JRC, **Ispra, Italy**

### **Solar Decathlon and Living Laboratory Sustainable Campus Initiatives** [14/07/2015]

- ISHVAC-COBEE Symposium, **Tianjin, China**

### **Energy System Analysis of Pilot Net-Zero Districts to Reduce CO<sub>2</sub> Emissions** [24/09/2013]

- 8<sup>th</sup> Conference on SDEWES, **Dubrovnik, Croatia**

### **Net-Zero Targets for Increasing Rational Exergy Management in Districts** [05/07/2012]

- 7<sup>th</sup> Conference on SDEWES, **Ohrid, Macedonia**

### **Optimizing Low CO<sub>2</sub> Solutions with Heat Pumps for Net-Zero Communities** [16/05/2011]

- 10<sup>th</sup> IEA Heat Pump Conference, **Tokyo, Japan**

### **Optimum Decision-Making Algorithm for Efficient Heating Cooling in Cities** [11/05/2010]

- 10<sup>th</sup> REHVA World Congress CLIMA 2010, **Antalya, Türkiye**

### **Optimization of Heat Pump Applications for Net-Zero Exergy Buildings** [21/05/2008]

- 9<sup>th</sup> IEA Heat Pump Conference, **Zürich, Switzerland**

### **Net Zero Energy or Net Zero Exergy Buildings?** [27/06/2007]

- ASHRAE Annual Meeting, Long Beach, **California, United States**

### **Reducing CO<sub>2</sub> Emissions with Rational Energy Management** [05/06/2007]

- World Environment Day: Melting Ice A Hot Topic, National Geographic Headquarters, **Washington, D.C.**

### **An Exergy Analysis after Hurricane Katrina: The Need for Green Buildings** [26/06/2006]

- ASHRAE Annual Meeting, **Quebec, Canada**