【Research related to Carbon Neutrality】

University/College	Faculty	Researcher	Research theme	URL/ Research overview	Remarks
Tokyo Metropolitan University	Economics and Business Administration	UCHIYAMA Tomonori	Economic function of sustainable investing	https://www.saa.or.jp/english/professional/journalprizes.html	
Tokyo Metropolitan University	Science	EHIRA Shigeki	Production of useful substances from atmospheric carbon dioxide and nitrogen gases using photosynthetic organisms.	https://sites.google.com/site/o3ehira/research	
Tokyo Metropolitan University	Science	OKA Daichi	Development of low-cost thin-film synthesis techniques for photoenergy conversion applications	https://sspc.cpark.tmu.ac.jp/sspc/ja/index.html	
Tokyo Metropolitan University	Science	OKAMOTO Takashi	Production of CO2 fixing hybrids by in vitro fertilization system	https://www.f-rei.go.jp/assets/contents/240401_Energy_02.pdf	
Tokyo Metropolitan University	Science	KIKKAWA So-ichi	Absorption and catalytic conversion of carbon dioxide using inorganic functional materials	https://yamazoelab.cpark.tmu.ac.jp/yamazoelab/ja/index.html https://www.tmu.ac.jp/stafflist/data/ka/30337.html	
Tokyo Metropolitan University	Science	SHIMOJO Masahiko	Invasion phenomenon of reaction-diffusion equations related to extinction of biological species considering climate change such as global warming	https://kaken.nii.ac.jp/ja/grant/KAKENHI-PROJECT-24K06817/	
Tokyo Metropolitan University	Science	TAMURA Koichiro	Development of methods with green computing for molecular phylogenetic analysis	https://biol.fpark.tmu.ac.jp/member/tamura/ja/	
Tokyo Metropolitan University	Science	MIZUGUCHI Yoshikazu	Development of new thermal management materials using superconductors	https://www.tmu.ac.jp/news/topics/36531.html	
Tokyo Metropolitan University	Science	YAMASHITA Aichi	Development of superconductor and thermoelectrc materials	Development of new superconductors which are aiming to the practical use as high-performance magnet for nuclear fusion reactor and MRI. Development of thermoelectric materials for high-performance module, which can directly convert the waste heat into the electricity.	
Tokyo Metropolitan University	Science	YAMAZOE Seizi	Developments of Direct Air Capture system and CO2 conversion catalysts	https://yamazoelab.cpark.tmu.ac.jp/yamazoelab/ja/index.html	
Tokyo Metropolitan University	Urban Environment Sciences	ISHIDA Tamao	Transformation of CO2 into valuable compounds by heterogeneous metal catalysts	Development of hetergeneous metal catalysts for conversion of CO2 into valuable compounds aiming at carbon neutral.	
Tokyo Metropolitan University	Urban Environment Sciences	IMAMURA Yoshiyuki	Flood risk management	https://suimon.fpark.tmu.ac.jp/	
Tokyo Metropolitan University	Urban Environment Sciences	UENO Atsushi	Study on Carbon Pool Concrete	https://carbon-pool.com/	
Tokyo Metropolitan University	Urban Environment Sciences	OKU Mami	Legal policy and multi-media approach to combat environmental issues, Environmental law and policy at local government level, Law and policy on urban development	https://www.tmu.ac.jp/stafflist/data/a/356.html	
Tokyo Metropolitan University	Urban Environment Sciences	KAJIHARA Koichi	Development of inorganic-based functional materials (e.g. efficient phosphors, solid electrolytes, cathode materials for rechargeable magnesium batteries, etc.)	https://kajiharalab.fpark.tmu.ac.jp/	
Tokyo Metropolitan University	Urban Environment Sciences	KATO Shungo	Measurement of atmospheric hydrogen in urban and suburban area	https://hydrogen.fpark.tmu.ac.jp/research.html	

Tokyo Metropolitan University	Urban Environment Sciences	KAWAKAMI Hiroyoshi	Fuel cells, all-solid-state secondary batteries, Direct air capture	URL: http://www.comp.tmu.ac.jp/kawakami-labn/	
Tokyo Metropolitan University	Urban Environment Sciences	SHISHIDO Tetsuya	Selectoive conversion of CO2 to value-added chemicals	Development of catalysts to CO2 conversion into useful chemicals such as CH4, CO, and lower alcohols	
Tokyo Metropolitan University	Urban Environment Sciences	SHUDO Toshio	Research on environmentally friendly energy utilization and vehicle power systems using alternative fuels such as hydrogen and ethanol.	https://shudo.fpark.tmu.ac.jp/	scheduled to end in March 2025
Tokyo Metropolitan University	Urban Environment Sciences	TAKAHASHI Hideo	Urban climatic environments, Urban heat island phenomenon, Short duration intense rainfall in cities, Climate change	https://www.ues.tmu.ac.jp/geog/guide/studies/index.html#studies02	scheduled to end in March 2025
Tokyo Metropolitan University	Urban Environment Sciences	TAKAHASHI Hiroshi	Physical Climatological Research on Climate Change	https://camo.fpark.tmu.ac.jp/pg129.html#research_j	
Tokyo Metropolitan University	Urban Environment Sciences	TANAKA Manabu	Hydrogen Production by Water Electrolysis, Polymer Electrolyte Fuel Cell, Rechargeable Battery (Lithium Battery, Air Battery)	https://m-tanaka.fpark.tmu.ac.jp/	
Tokyo Metropolitan University	Urban Environment Sciences	NUMATA Shinya	A study on sustainable use of nature resources	https://nmt.fpark.tmu.ac.jp/	
Tokyo Metropolitan University	Urban Environment Sciences	HIHARA Katsuya	Research of sustainable tourism market		
Tokyo Metropolitan University	Urban Environment Sciences	MUNAKATA Hirokazu	Development of highly efficient electrochemical energy conversion/storage devices for reduction of greenhouse gas emissions	https://www.tmu.ac.jp/stafflist/data/ma/820.html	
Tokyo Metropolitan University	Urban Environment Sciences	YAMATO Masafumi	Research on Direct Air Capture	We aim to develop ultra-high gas permeability membranes for a gas separation membrane-based Direct Air Capture (DAC) system, with the goal of achieving direct CO2 removal from the atmosphere at low energy costs.	
Tokyo Metropolitan University	System Design	ABO Makoto	Development of a differential absorption lidar for improving the accuracy of linear precipitation band forecasts		
Tokyo Metropolitan University	System Design	ABO Makoto	Estimation of CO2 fluxes from large-scale emission sources using differential absorption lidar observations		
Tokyo Metropolitan University	System Design	OTA Ryousuke	Dynamic wireless power transfer for electric vehicles	https://pbs.twimg.com/media/FyJVmfeaIAAA9B_?format=jpg&name=4096x4096	
Tokyo Metropolitan University	System Design	KOBAYASHI Satoshi	Lower cost hydrogen storage containers	To reduce the cost of hydrogen tanks for fuel cell vehicles, we are developing a method to minimize the use of carbon fiber.	
Tokyo Metropolitan University	System Design	SHIBATA Yasukuni	Development of lidar system for measuring greenhouse gas profile	https://lidar.fpark.tmu.ac.jp/labo/	
Tokyo Metropolitan University	System Design	SHIMOMURA Yoshiki	Design Theory, Innovation Design, Product-Service System, Environmentally Conscious Design	https://smmlab.fpark.tmu.ac.jp/	
Tokyo Metropolitan University	System Design	SUGAWARA Hiroharu	Feasibility Study on utilization of low-temperature excess waste heat	https://scrapbox.io/tmuMSEsugawaraLabPR/LowTempWasteHeat	

Tokyo Metropolitan University	System Design	SUZUKI Yukihisa	large-scale computer simulation, electromagnetic compatibility, wireless power transfer, application of generative AI	https://www.tmu.ac.jp/extra/download.html?d=assets/files/download/keisya/r3/e4_suzuki.pdf https://steps-emf.net/ https://www.sd.tmu.ac.jp/research/data/sa/6279.html	
Tokyo Metropolitan University	System Design	TAKAHASHI Satoru	International Standardization of Test Methods for Integrity of Thermal Barrier Coatings in Carbon-Neutral Turbines		
Tokyo Metropolitan University	System Design	TAKESUE Naoyuki	Method of constructing industrial robots with lightweight materials aimed for energy conservation	https://www.robocip.or.jp/	
Tokyo Metropolitan University	System Design	WADA Keiji	Research for power electronics	https://sites.google.com/view/tmupel	
Advanced Institute of Industrial Technology		ITAKURA Hiroaki	Sustainable Regionable Management	https://italabo.com/	
Advanced Institute of Industrial Technology		TAKASHIMA Shinji	Future Mobility and Infrastructure design as Systems	Considering historically changes in the purpose of movement, focuses on the "Qualitative value" of movement. Envisioning the future 10 years from now, we propose the realization of "Mobility that allows you to encounter various things you never knew" as a new mobility value.	
Advanced Institute of Industrial Technology		MURAKOSHI Hideki	Light transmittance algae density analyser and particle size analyser – Towards the construction of an optimal culture environment for microalgae –	https://www.houjin-tmu.ac.jp/sustainability/environmental_report_2022/?pNo=30	
Tokyo Metropolitan College of Industrial Technology		IKEDA Hiroshi	Development of novel environmentally conscious cleaning method with microbubble and ultrasonic vibration	My research is Development of novel environmentally conscious cleaning method of some machine parts with microbubble and ultrasonic vibration and this research is that the new cleaning technology that can compensate for the shortcomings of ultrasonic and microbubble cleaning by combining the effectiveness of microbubbles in an ultrasonic acoustic field was reported.	
Tokyo Metropolitan College of Industrial Technology		ISHIBASHI Masaki	Study on High frequency Inverter for NOx Reduction System Using Dielectric Barrier Discharge	This research aims not only to reduce NOx through dielectric barrier discharge but also to develop a power supply that reduces the electrical energy required for the discharge. This approach seeks to lower environmental impact while achieving efficient energy utilization.	
Tokyo Metropolitan College of Industrial Technology		ISHIBASHI Masaki	Research on Practical Application of Magnetic Pulse Welding	The seam welding method, which joins metals in a linear fashion, is a fusion welding technique that requires a large amount of electrical energy. In contrast, magnetic pulse welding is a new joining method that is dramatically more energy-efficient and can instantaneously achieve seam-like connections compared to seam welding. This research focuses on advancing the practical application of magnetic pulse welding.	
Tokyo Metropolitan College of Industrial Technology		KAWASAKI Norihiro	Study on Demand and Supply Control System using Hydrogen Storage with a Large Penetration of Photovoltaic Generation		
Tokyo Metropolitan College of Industrial Technology		KUDO Masaki	Research on cellulose nanofiber composite materials with high functionality	https://www.metro-cit.ac.jp/contents/000010972.pdf	
Tokyo Metropolitan College of Industrial Technology		KOIDE Teruaki	Study on a wind turbine with valuable blade pitch	https://www.metro-cit.ac.jp/contents/000011997.pdf	
Tokyo Metropolitan College of Industrial Technology		SAITO Hiroshi	Development of Phase Change Self-Excited Oscillating Heat Transport Devices with Low Environmental Impact Refrigerants	https://www.mmlab.mech.tuat.ac.jp/mmlab/research/research-ht-j.shtml	

Tokyo Metropolitan College of Industrial Technology	SAGARA Takuya	①Synthesis of hydrogen storage alloy-filled CNTs and TiO2-filled CNTs by solid-liquid interfacial arc discharge method ②Development of conductive TPU finger bending sensors for XR application	①We are attempting to synthesize CNTs filling FeTi alloys. We will experimentally verify whether it is possible to solidify hydrogen gas under high pressure (GPa) within the nanocavities of CNTs. If this is difficult, we will consider whether it is possible to reduce the hydrogen embrittlement of the alloy. On the other hand, we believe that CNTs filling TiO2 can be used as a reusable water purification agent due to the improved photocatalytic effect of one-dimensional TiO2.②General sensors that detect the bending angle of each finger are expensive, and it is difficult to prepare sensors that are tailored to the size of each individual's finger. In addition, optical detection of finger bending angles; for example, motion capture, has limitations such as being blocked by objects or angles that cannot be seen. Therefore, in this study, we aim to create a finger bending sensor that can be designed to suit the user, and to provide a sensor that can detect the bending angle of a human finger in a VR or AR space using a microcontroller and computer.	
Tokyo Metropolitan College of Industrial Technology	SUGIMOTO Seiichi	Development of recycled structural materials using HHP method for recycling the wastes and study of their material properties	https://www.houjin-tmu.ac.jp/topics/topics16025/#kiji02	
Tokyo Metropolitan College of Industrial Technology	SUZUKI Tatsuo	The study of a revolutionary water-splitting photocatalyst "the monolayer of boron phosphide" in order to produce green hydrogen by direct use of solar energy	https://www2.metro-cit.ac.jp/~tatsuo/	
Tokyo Metropolitan College of Industrial Technology	CAO Meifen	「High Efficient Electric Drive for E-Mobility」、「Research of Autonomous Delivery Robot Towards Realization of Sustainable Logistics」	https://ieeexplore.ieee.org/abstract/document/5157705	
Tokyo Metropolitan College of Industrial Technology	HASEGAWA Osamu	Press forming of the material for weight reduction of automobile	Basic study on bending technology when replacing structural materials such as automobile bumpers and seat frames with aluminum alloys and magnesium alloys, and when replacing copper stranded wire with aluminum strips for bus bars.	
Tokyo Metropolitan College of Industrial Technology	FUKANO Azusa	Research on nuclear fusion as a new energy source to replace petroleum and coal	https://www.nifs.ac.jp	
Tokyo Metropolitan College of Industrial Technology	YAMAMOTO Shoji	Promotion of educational DX through knowledge acquisition	https://www.houjin-tmu.ac.jp/topics/topics13002/#kiji04	ended in March 2024
Tokyo Metropolitan College of Industrial Technology	YOSHIDA Kenichi	Solid Oxide Fuel Cell	From a carbon-neutral perspective, I am conducting research into solid oxide fuel cells that use hydrogen, which does not emit CO2, as fuel. From a nature-positive perspective, I am conducting research into solid oxide fuel cells that use methane gas generated from sewage treatment plants, food waste and so on,as fuel.	

【Research related to Nature Positive】

University/College	Faculty	Researcher	Research theme	URL/ Research overview	Remarks
Tokyo Metropolitan University	Science	KATO Hidetoshi	The collection and accumulation of biodiversity information in Tokyo	A project utilizing DX to collect and accumulate wildlife information in Tokyo through public-private-academic collaboration	
Tokyo Metropolitan University	Urban Environment Sciences	OSAWA Takeshi	Ecosystem-based disaster risk reduction, Evaluation of any ecosystem functions as Green Infrastructure	https://www.tmu.ac.jp/news/topics/35212.html	
Tokyo Metropolitan University	Urban Environment Sciences	OKU Mami	Legal policy and multi-media approach to combat environmental issues, Environmental law and policy at local government level, Law and policy on urban development	https://www.tmu.ac.jp/stafflist/data/a/356.html	

Tokyo Metropolitan University	Urban Environment Sciences	KAWAHIGASHI Masayuki	Analyses on ecological functions of soils in green infrastructures	Artificially constructed greenery spaces in urban areas can be called as green infrastructures which is expected to be available to compensate artificially reclaimed area. Although the primary productivity of the green infrastructure is relatively high, soils as planting bases are poorly developed. The relationship between the plant growth and soil development is still not clear. Spatial and temporal change in soil properties of the plant basement is mainly focused to know the relationship between soil development and the plant growth.	
Tokyo Metropolitan University	Urban Environment Sciences	NUMATA Shinya	A study on sustainable use of nature resources	https://nmt.fpark.tmu.ac.jp/	
Advanced Institute of Industrial Technology		ITAKURA Hiroaki	Sustainable Regionable Management	https://italabo.com/	
Advanced Institute of Industrial Technology		TAKASHIMA Shinji	Future Mobility and Infrastructure design as Systems	Considering historically changes in the purpose of movement, focuses on the "Qualitative value" of movement. Envisioning the future 10 years from now, we propose the realization of "Mobility that allows you to encounter various things you never knew" as a new mobility value.	
Tokyo Metropolitan College of Industrial Technology		SAGARA Takuya	①Synthesis of hydrogen storage alloy-filled CNTs and TiO2-filled CNTs by solid-liquid interfacial arc discharge method ②Development of conductive TPU finger bending sensors for XR application	①We are attempting to synthesize CNTs filling FeTi alloys. We will experimentally verify whether it is possible to solidify hydrogen gas under high pressure (GPa) within the nanocavities of CNTs. If this is difficult, we will consider whether it is possible to reduce the hydrogen embrittlement of the alloy. On the other hand, we believe that CNTs filling TiO2 can be used as a reusable water purification agent due to the improved photocatalytic effect of one-dimensional TiO2.②General sensors that detect the bending angle of each finger are expensive, and it is difficult to prepare sensors that are tailored to the size of each individual's finger. In addition, optical detection of finger bending angles; for example, motion capture, has limitations such as being blocked by objects or angles that cannot be seen. Therefore, in this study, we aim to create a finger bending sensor that can be designed to suit the user, and to provide a sensor that can detect the bending angle of a human finger in a VR or AR space using a microcontroller and computer.	
Tokyo Metropolitan College of Industrial Technology		SUGIMOTO Seiichi	Development of recycled structural materials using HHP method for recycling the wastes and study of their material properties	https://www.houjin-tmu.ac.jp/topics/topics16025/#kiji02	
Tokyo Metropolitan College of Industrial Technology		YOSHIDA Kenichi	Solid Oxide Fuel Cell	From a carbon-neutral perspective, I am conducting research into solid oxide fuel cells that use hydrogen, which does not emit CO2, as fuel. From a nature-positive perspective, I am conducting research into solid oxide fuel cells that use methane gas generated from sewage treatment plants, food waste and so on,as fuel.	