

3rd International Conference on Sustainable Chemical & Environmental Engineering



SUST
ENG
2024

PROGRAMME

4th - 8th September 2024

Rethymno, Crete, Greece

hybrid event

www.susteng.tuc.gr



organizers



Design of
Environmental
Processes Lab



Technical University of Crete
School of Chemical and
Environmental Engineering

co - organizers



Cyprus
University of
Technology

Dear friends and colleagues,

I am pleased to invite you to the 3rd International Conference on Sustainable Chemical and Environmental Engineering (SUSTENG 2024), which will be held in Rethymno, Crete, Greece, between 4th to 8th September 2024.

The conference is organized by the "Design of Environmental Processes Laboratory", of the School of Chemical and Environmental Engineering, Technical University of Crete and the Cyprus University of Technology.

The SUSTENG 2024 Conference will take place both with physical and virtual presence.

The conference aims to encourage the exchange of knowledge between academicians, scientists and engineers on hot issues and current developments in chemical and environmental engineering through sustainable perspective. The participants will have the opportunity to present their recent research findings on an extended spectrum of conference topics and be informed about new challenges, future trends, and technological innovations on sustainable processes following the principles of circular economy.

After the completion of the conference, all abstracts/full papers will be published in the SUSTENG 2024 Conference Proceedings with ISBN number, while selected manuscripts will be published to at least two Special Issues at high IF scientific journals (more information will be released soon).

The conference Chair

Petros Gikas

Professor

Head of the "Design of Environmental Processes Lab"

School of Chemical and Environmental Engineering

Technical University of Crete, Greece



SESSIONS OF SUSTENG 2024

Session 1: Solid waste management

Session 2: Wastewater management (I)

Session 3: Wastewater management (II)

Session 4: Biochemical engineering

Session 5: Materials science

Session 6: Water resources management

Session 7: Soil management

Session 8: Anaerobic digestion

Session 9: Water treatment

Session 10: Environmental management

Scientific committee:

Achille Ephrem Assogbadjo, University of Abomey-Calavi, Benin

Alexandros Katsaounis, University of Patras, Greece

Alexandros Stefanakis, Technical University of Crete, Greece

Anastasios Zouboulis, Aristotle University of Thessaloniki, Greece

Andreas Andreopoulos, National Technical University of Athens, Greece

Andrew Livingstone, Queens Mary University, UK

Anestis Vlysidis, National Technical University of Athens, Greece

Angela Gorgoglione, Universidad de la República, Uruguay

Antonios Kokosis, National Technical University of Athens, Greece

Antonios Papadakis, Region of Crete, Greece

Apostolos Giannis, Technical University of Crete, Greece

Apostolos Voulgarakis, Technical University of Crete, Greece

Aristeidis Koutroulis, Technical University of Crete, Greece

Artin Hatzikioseyan, National Technical University of Athens, Greece

Athanasia Tekerlekopoulou, University of Patras, Greece

Athanasios Kungolos, Aristotle University of Thessaloniki, Greece

Athanasios Stasinakis, University of the Aegean, Greece

Baoning Zhu, Beijing University of Chemical Technology, China

Christos Akrotos, Democritus University of Trace, Greece

Constantinos Chrysikopoulos, Technical University of Crete, Greece

Cristina Trois, University of Kwa Zulu –Natal, South Africa

Dagmar Juchelkova, Technical University of Ostrava, Czech Republic

Danae Venieri, Technical University of Crete, Greece

Daniel Mamais, National Technical University of Athens, Greece

Despoina Vamvouka, Technical University of Crete, Greece

Dimitrios Dermantas, National Technical University of Athens, Greece

Dimitris Vayenas, University of Patras, Greece

Dinis Juizo, University of Eduardo Mondlane, Mozambique

Dionissios Mantzavinos, University of Patras, Greece

Dionysia Kolokotsa, Technical University of Crete, Greece

Dorothea Kasiteropoulou, University of Thessaly, Greece

Evan Diamantopoulos, Technical University of Crete, Greece

Ezio Ranieri, University of Bari, Italy

Elvis Tiburue, University of Ghana

Gagik Torosyan, State Engineering University of Armenia, Armenia

George Karatzas, Technical University of Crete, Greece

George Kyzas, International Hellenic University, Greece

George Papapolymerou, University of Thessaly, Greece

Isam Janajreh, Khalifa University, UAE

Jacek Dach, Poznan University of Life Sciences, Poland

Justin Chun-Te Lin, Feng Chia University, Taiwan

Keisuke Kuroda, Toyama Prefectural University Japan

Konstantinos Moustakas, National Technical University of Athens, Greece

Konstantinos Komnitsas, Technical University of Crete, Greece

Komi Agboka, University of Lome, Togo

Lazaros Papageorgiou, University College, UK

Lesly Tejada, University of Cartagena, Colombia

Manish Kumar, University of Petroleum and Energy Studies, India

Maria Christina Fragkou, University of Chile, Chile

Maria Loizidou, National Technical University of Athens, Greece

Michael Fountoulakis, University of the Aegean, Greece

Michael Georgiadis, Aristotle University of Thessaloniki, Greece

Michael Kornaros, University of Patras, Greece

Michalis Koutinas, Cyprus University of Technology

Mohamed El Shaer, Zagazig University, Egypt

Mohamed Elhag, King Abdulaziz University, Saudi Arabia

Muhammad Arslan Ashraf, Government College University Faisalabad, Pakistan

Nicolas Kalogerakis, Technical University of Crete, Greece

Nikolaos Diangelakis, Technical University of Crete, Greece

Nikolaos Kiratzis, University of Western Macedonia, Greece

Nikolaos Nikolaidis, Technical University of Crete, Greece

Nikolaos Paranychanakis, Technical University of Crete, Greece

Noredine Loeid Mahdjoub, University of Kwa Zulu-Natal, South Africa

Okan Tarik Komesli, Atatürk University, Turkey

Panagiota Angeli, University College, UK

Partycja Pochwatka, University of Life Sciences in Lublin, Poland

Paraschos Melidis, Democritus University of Trace, Greece

Paraskevi Panagiotopoulou, Technical University of Crete, Greece

Petros Gikas, Technical University of Crete, Greece

Phillimon Odirile, University of Botswana, Botswana

Ruihong Zhang, University of California Davis, USA

Romain Lucas Glele Kakai, University of Abomey Calavi, Benin

Sema Sevinc Sengor, Middle East University, Turkey

Shan Yi, University of Auckland, New Zealand

Simona Di Gregorio, University of Pisa, Italy

Simos Malamis, National Technical University of Athens, Greece

George Tchobanoglous, University of California Davis, USA

Georgios Arampatzis, Technical University of Crete, Greece

Georgios Papadakis, Agricultural University of Athens, Greece

Gerasimos Lyberatos, National Technical University of Athens, Greece

Hassan Azaizeh, Tel-Hai College, Israel

Herve Boileau, University of Savoie Mont-Blanc, France

Hery Tiana Rakotondramiarana, University of Antananarivo, Madagascar

Ioannis Kalavrouziotis, Hellenic Open University, Greece

Ioannis Manariotis, University of Patras, Greece

Ioannis Tsanis, Technical University of Crete, Greece

Ioannis Vyrides, Cyprus University of Technology

Ioannis Yentekakis, Technical University of Crete, Greece

Spyridon Ntougias, Democritus University of Trace, Greece

Stergios Vakalis, University of the Aegean, Greece

Stratos Pistikopoulos, Texas A&M University, USA

Stylianios Rozakis, Technical University of Crete, Greece

Theocharis Tsoutsos, Technical University of Crete, Greece

Therese Lee Chan, The University of the West Indies, Trinidad and Tobago

Timothy Ginn, Washington State University, USA

Tonni Agustiono Kurniawan, Xiamen University, China

Vasileios Takavakoglou, Hellenic Agricultural Organization – DEMETER, Greece

Vassilios Tsihrintzis, National Technical University of Athens, Greece

Wei-Qin Zhuang, University of Auckland, New Zealand

Yaoyu Zhou, Hunan Agricultural University, China



SUSTENG 2024 - PROGRAMME AT A GLANCE

DAY 1 - Wednesday 4 September Susteng 2024	
Rethymno Youth Center	
Registration	19:30 - 20:00
Welcome reception	20:00 - 22:00

DAY 2 - Thursday 5 September Susteng 2024	
House of Culture	
Registration	09:30 - 11:00
<i>Coffee break - Posters viewing</i>	10:45 - 11:00
Greetings	11:00 - 12:30
PLENARY LECTURE: Prof. P. Gikas Chair: K. Kuroda, A.E. Assogbadjo	12:30 - 13:15
<i>Lunch break</i>	13:15 - 14:45
Session 1: Solid waste management	14:45 - 16:15
Session 2: Wastewater management (I)	16:30 - 17:15

DAY 3 - Friday 6 September Susteng 2024	
House of Culture	
Session 3: Wastewater management (II)	09:30 - 10:45
<i>Coffee break - Posters viewing</i>	10:45 - 11:00
PLENARY LECTURE: Prof. T. Tsoutsos Chair: P. Gikas, A.E. Assogbadjo	11:00 - 11:45
Session 4: Biochemical engineering	11:45 - 12:30
Session 5: Materials science	12:30 - 13:15
<i>Lunch break</i>	13:15 - 14:45
PLENARY LECTURE: Prof. K. Kuroda Chair: P. Gikas, T. Tsoutsos	14:45 - 15:30
Session 6: Water resources management	15:30 - 16:00
Rethymno	
Field visit at Wastewater Treatment Plant of Rethymno	18:30 - 19:30
Gala dinner	20:00 - 23:00

DAY 4 - Saturday 7 September Susteng 2024	
House of Culture	
Session 7: Soil management	09:30 - 10:45
<i>Coffee break - Posters viewing</i>	<i>10:45 - 11:00</i>
PLENARY LECTURE: Prof. A.E. Assogbadjo Chair: P. Gikas, K. Kuroda	11:00 - 11:45
Session 8: Anaerobic digestion	11:45 - 12:30
Session 9: Water treatment	12:30 - 13:15
<i>Lunch break</i>	<i>13:15 - 14:45</i>
Session 10: Environmental management	14:45 - 16:15
Closing ceremony	16:15 - 17:00

DAY 5 - Sunday 8 September Susteng 2024	
Rethymno	
Conference excursion at the Historical Monastery of Arkadi and the Archeological Museum of Eleftherna (depending on participation)	10:00 - 16:00



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DAY 2 - Thursday 5 September Susteng 2024	
House of Culture	
Registration	09:30 - 11:00
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Greetings	11:00 - 12:30
PLENARY LECTURE: Prof. P. Gikas Water reclamation and reuse: Opportunities and Challenges Chair: K. Kuroda, A.E. Assogbadjo	12:30 - 13:15
Lunch break	13:15 - 14:45
Session 1: Solid waste management Chair: A. Giannis, L. Afxentiou	14:45 - 16:15
Technoeconomic assessment of pay as you throw system for the city of Chania L. Afxentiou, A. Giannis	14:45 - 15:00
The effect of biochar addition on the properties of alkali-activated materials produced from silicate tailings K. Komnitsas, V. Karmali, D. Vathi, A Kritikaki	15:00 - 15:15
A Review of EU refineries oily sludge waste production, management options and sustainability assessment of traditional and emerging oily sludges treatment techniques E. Vaiopoulou, A. Mianzan , W. Odle, K. Sakkalis	15:15 - 15:30
Biomass burning emissions from varying landuse over equatorial Southeast Asia (ESEA) J. Sentian, J.H. Chin, F.F. Adnan	15:30 - 15:45
Optimized location of electric vehicle batteries recycling center in Attica A. Giannis, A. Lygizos, E. Kastanaki	15:45 - 16:00
Current Trends, Challenges, and Future Opportunities in Biogas Production from Hospital Food Waste in Europe: Perspectives from the CaringNature Project	16:00 - 16:15

I. Vyrides	
Session 2: Wastewater management (I) Chair: E. Vaiopoulou, C. Rodriguez-Rodriguez	16:30 - 17:15
Treatment of pharmaceutical-containing wastewater with a hybrid approach of advanced oxidation with persulphates/UV and biological removal by fungal pellets C. Rodriguez-Rodriguez, S. D. Villegas, M. D. Ramirez, G. V. Castro, M. M. Masís, R.C. Rodriguez	16:30 - 16:45
Effect of hydrogen peroxide on colour changes during the degradation of sulfamethoxazole by photo Fenton U. Duoandicoechea, A. De Luis, N. Villota	16:45 - 17:00
Domestic wastewater treatment by a high-rate anaerobic MBR system E. Politou, K. Azis, A. Makri, S. Ntougias, N. Remma, P. Melidis	17:00 - 17:15

DAY 3 - Friday 6 September Susteng 2024	
House of Culture	
Session 3: Wastewater management (II) Chair: G. Panayiotou, D. Gavrilescu	09:30 - 10:45
Effect of iron catalyst on water quality parameters during the oxidation of diclofenac by photo-Fenton treatment U. Duoandicoechea, J. M. Lomas, N. Villota	09:30 - 09:45
Nutrient recovery from urine diverting dry toilets via pyrolysis M. E. Koulouri, M.R. Templeton, G. D. Fowler	09:45 - 10:00
Limassol District Local Government Organisation: Challenges and opportunities in sewage treatment G. Panayiotou, P. Marti	10:00 - 10:15
Advanced primary filtration process for the upgrade of overloaded activated sludge plants K. Tsamoutsoglou, P. Gikas	10:15 - 10:30
Preparation of biochar derived from olive mill solid waste in a circular economy approach for enhanced adsorption of trihalomethanes from water S. Azerrad, H. Azaizeh, E. Kurzbaum	10:30 - 10:45
<i>Coffee break - Posters viewing</i>	<i>10:45 - 11:00</i>
PLENARY LECTURE: Prof. T. Tsoutsos Unlocking the potential of heritage-based innovation for sustainable development: The HI-EURECA-PRO project Chair: P. Gikas, A.E. Assogbadjo	11:00 - 11:45
Session 4: Biochemical engineering Chair: R. Konstantinou, T. Tsoutsos	11:45 - 12:30
Enhancement of starch hydrolysis using immobilized cells and enzymes of two Aspergillus strains on oxidized carbonaceous materials R. Konstantinou	11:45 - 12:00
Bioprocess development for thermoplastic starch polyhydroxybutyrate biodegradation using algal-microbial co-cultures F. Pyrilli, E. Syranidou, G. Constantinides, M. Koutinas	12:00 - 12:15

A critical examination of macroalgae biomass utilization: Perspectives from life cycle assessments C. Nikoloudakis, A. Pantis, T. Tsoutsos	12:15 - 12:30
Session 5: Materials science Chair: S. Azerrad, D. P. Gournis	12:30 - 13:15
The green synthesis of irregular gold nanoparticles and their application in nanomedicine R. Mariychuk, R. Smolkova, L. Grishchenko, V. Lisnyak	12:30 - 12:45
Innovative bioprocess employing recyclable immobilized enzyme for paraoxon removal in water and effluents: Phosphotriesterase immobilized on Fe₃O₄-SiO₂-NH₂ magnetic nanocomposites S. Azerrad	12:45 - 13:00
2D Xenos of Group-14: New synthetic strategies and derivatives for environmental and energy applications D. P. Gournis	13:00 - 13:15
<i>Lunch break</i>	<i>13:15 - 14:45</i>
PLENARY LECTURE: Prof. K. Kuroda Emerging contaminants in groundwater: threats in the 21st century Chair: P. Gikas, T. Tsoutsos	14:45 - 15:30
Session 6: Water resources management Chair: K. Tsamoutsoglou, E. Vaiopoulou	15:30 - 16:00
From data to decision: understanding and mitigating uncertainty in watershed water quality models A. Gorgoglione	15:30 - 15:45
Water use and efficiencies in fuel refining sites E. Vaiopoulou, E. Fiddaman, S. Gibbons, S. Mackay, J. Shaw, L. Leclezio, J. Russel, M. Hjort, L. G. Guerrero	15:45 - 16:00
Rethymno	
Field visit at Wastewater Treatment Plant of Rethymno	18:30 - 19:30
Gala dinner	20:00 - 23:00

DAY 4 - Saturday 7 September Susteng 2024	
House of Culture	
Session 7: Soil Management Chair: F. J. Chadare, A. Stefanatou	09:30 - 10:45
Soil improvement by electro carbonation induced calcite precipitation (ECICP) from the seawater H. Abdeh Keykha, M. Mavroulidou, H. Mohamadzadeh Romiani Hadi	09:30 - 9:45
Biocementation via microbial induced struvite precipitation: A mini review on cleaner method of soil stabilization S. Joshi, M. Mavroulidou, M. J. Gunn	09:45 - 10:00
PFAS soil treatment processes – a review of operating ranges and constraints E. Vaiopoulou, J. Hurst, S. Hale, J. Miles, E. Dall, W. Gevaerts, J. Burdick, M. Hjort	10:00 - 10:15
Effects of fungicides and bactericides on BVOC emissions in cypriot vineyard soils	10:15 - 10:30

K. Kaikiti, S. Savvides, L. Philippot, I. Ioannides, A. Agapiou, M. Omirou	
Use of residues generated from olive cultivation and olive oil production for the enhancement of soil quality A. Stefanatou, A. Kalampokidis, T. Maneka, G.E. Dimitriou, M. Pavlidis, M. Veloutsos, A. Galanidis, F. Galliou, T. Manios, D.F. Lekkas, P. Dimitrakopoulos, N. Fyllas, S. Vakalis, M. Fountoulakis	10:30 - 10:45
<i>Coffee break - Posters viewing</i>	<i>10:45 – 11:00</i>
PLENARY LECTURE: Prof. A.E. Assogbadjo Review on ecosystems nature-based restoration initiatives in Africa Chair: P. Gikas, K. Kuroda	11:00 - 11:45
Session 8: Anaerobic digestion Chair: K. Tsamoutsoglou, G. Antonopoulou	11:45 - 12:30
Environmental and energetic analysis of biogas plants supplied with different substrate scenarios P. Pochwatka, J. A. Kowalczyk, J. Mazurkiewicz, J. Pulka, K. Kupryaniuk, J. Dach	11:45 - 12:00
Designing sustainable processes for methane and hydrogen production using poplar woody sawdust biomass: The effect of chemical pretreatment G. Antonopoulou, I. Apostolopoulos, A. Tekerlekopoulou	12:00 - 12:15
Modelling hollow fibre membrane bioreactors for biogas purification A. Hatzikioseyan, J. Das, P. Lens	12:15 - 12:30
Session 9: Water treatment Chair: A. Papadakis, T. Thodosiadis-Thomaidis	12:30 - 13:15
The use of hyperspectral imaging in aquatic vegetation analysis J. Kosteki, S. Myszograj, E. Płuciennik-Koropczuk, I. Krupińska	12:30 - 12:45
Systematic environmental surveillance for legionella detection and treatment in a hospital water distribution system in the region of Crete during covid-19 era A. Papadakis, E. Koufakis, K. Tsamoutsoglou, N. Gikas, D. Chochlakis, A. Psaroulaki, P. Gikas	12:45 - 13:00
Unseen processes in freeze desalination: molecular dynamics of nucleation, crystal growth, and ion entrapment – a short review I. Janajreh, K. El Kadi	13:00 - 13:15
<i>Lunch break</i>	<i>13:15 - 14:45</i>
Session 10: Environmental Management Chair: S. Lyle, A.E. Assogbadjo	14:45 - 16:15
Pangaea.cubes - IoT low power challenges towards sustainability H/W - S/W design implementations and applications T. Thodosiadis-Thomaidis, G. Panagopoulou, V. Vorrias	14:45 - 15:00
Development of sustainable communication systems supported by high-impact environmental energy sources for people on the Move S. Lyle, K. Pappas, C. Lyle	15:00 - 15:15
Forest food resources back to the menu for enhancing food sovereignty in a context of high hybridation: case of Adansonia digitata and Irvingia gabonensis	15:15 - 15:30

F. J. Chadare , F.T.K Fassinou, S. Ahouansou Montcho , M. Affonfere, A.E. Assogbadjo	
Early-stage mathematical modeling of solution spray pyrolysis for the fabrication of functional ceramic films N. Fotiadi , D. Lazaridis, N. Rigakis, N. Kiratzis	15:30 - 15:45
Life cycle assessment to address key environmental impact elements of ERASE, an innovative in situ remediation technology G. Beretta , E. Sezenna, G. Dolci, L. Rigamonti, S. Saponaro, C. Carnabuci, D. Vezzoli	15:45 - 16:00
West african mangroves in the context of climate change: social-ecological dynamics, challenges and perspectives R. Glèlè Kakaï	16:00 - 16:15
Closing ceremony Chair: P. Gikas, K. Kuroda, A.E. Assogbadjo, T. Tsoutsos	16:15 - 17:00

DAY 5 - Sunday 8 September Susteng 2024	
Rethymno	
Conference excursion at the Historical Monastery of Arkadi and the Archeological Museum of Eleftherna (depending on participation)	10:00 - 16:00

Posters	
House of Culture-Upper Floor	

Biogas potential of distillery stillage and evaluation of digestate as a potential fertilizer
I. Vaskina, R. Vaskin, M. Cieslik, A. Lewicki, L. Demkova, M. Skidanenko, S. Sydorenko

Modelling Methane Emissions Resulting from Municipal Solid Waste Management: Reduction Options and Environmental Impact

D. Petrisor, C. Cirjan , D. Gavrilesco, C. Teodosiu

Modeling of Waste Electrical and Electronic Equipment Generation Rate using Multiple Regression Analysis

M. Gavrilesco, D. Gavrilesco

Evaluation of Biochar from Sewage Sludge for Sustainable Carbon Adsorption

L. D. Tshenyego, P.T. Odirile, A. Giannis, P. Gikas

Unlocking the timeless wisdom of Athens: A journey towards sustainability through design

D. Tzourmakliotou, E. Sourli

Life Cycle Assessment of PLA/MXene Nanocomposite

V. Tzatzadakis, A.Thomos, F. Gojda, F. Krasanakis, K. Chrissopoulou, S. Anastasiadis, E.

Patelarou, M. Stylianakis

Decarbonisation of asphalt mix production

A. Wozzuk, S. Malinowski, R. Panek

Exploring innovative cathodes based on perovskites in Microbial Fuel Cells

L. Skopas, G. Bampos , I. Apostolopoulos, S. Bebelis, G. Antonopoulou

Application of the primary filtration process in overloaded WWTPs

K. Tsamoutsoglou, P. Gikas

Hydrocyclone for the treatment of municipal primary wastewater

K. Tsamoutsoglou, A. Kechagias, P. Gikas

The impact of substrate extrusion on the energy and economic efficiency of biogas plant operation

K. Kupryaniuk, K. Witaszek, P. Pochwatka, J. Mazurkiewicz, I. Vaskina, D. Janczak, J. Dach




Quality criteria for water reuse in the Mediteranean basin

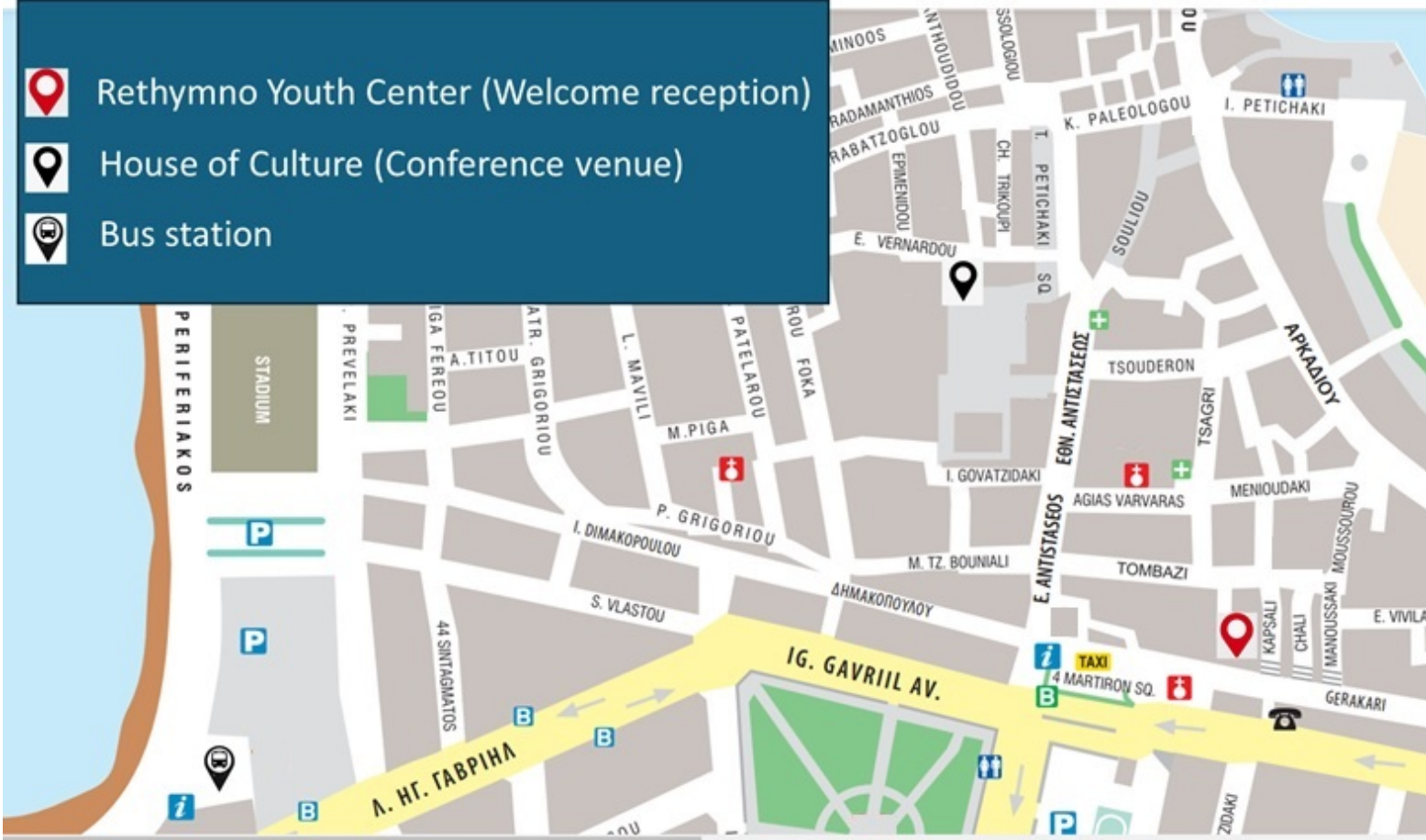
E. Gika, V. Tzika, F. Ranieri, A.C. Ranieri, E. Ranieri, P. Gikas

Carbon dioxide capture from actual industrial flue gas using microalgae

G. Makaroglou, D. Mitrogiannis, P. Gikas

Rethymno City map – SUSTENG 2024

-  Rethymno Youth Center (Welcome reception)
-  House of Culture (Conference venue)
-  Bus station



Contact

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