

Faculty of Chemical Engineering and Technology
University of Zagreb



FKITMCMXIX



in cooperation with

Hrvatske vode, Legal entity for water management (HR)
Department of Civil & Environmental Engineering, College of Science,
Engineering and Technology, Jackson State University (USA)
Croatian American Society (HR)
Slovenian Biomass Association (SLO)
ODRAZ, Sustainable Community Development (HR)

3rd International Symposium on
Environmental Management
Toward Sustainable Technologies



Conference Program

October 26 - 28, 2011
Faculty of Chemical Engineering and Technology, Zagreb, Croatia

Sponsored by:



Organized by:

Faculty of Chemical Engineering and Technology, University of Zagreb

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Hrvatske vode, Legal entity for water management (HR)

Department of Civil & Environmental Engineering, College of Science, Engineering and Technology, Jackson State University (USA)

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Under the auspice of:

Croatian Parliament; Ministry of Environmental Protection, Physical Planning and Construction; Ministry of Science, Education and Sport; Ministry of the Sea, Transport and Infrastructure; Ministry of Environment and Spatial Planning of Kosovo; Office for Sustainable Development of Monte Negro; University of Zagreb; University of Split; Croatian Academy of Engineering; Croatian Environment Agency; Environmental Protection and Energy Efficiency Fund; Croatian Chamber of Economy; American Chamber of Commerce in Croatia (Green Building Council); Croatian Business Council for Sustainable Development; Energy Institute Hrvoje Požar; The Institute of Economics, Zagreb; The Croatian Association of Engineers; Croatian Society of Chemical Engineers; Croatian Chamber of Architects; District of Cazin (BIH)

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October 25 (Tuesday)	
17.00 – 19.00	<i>On-site registration at Conference info-desk (Congress Hall B) at Faculty of Chemical Engineering and Technology, Marulićev trg 19, Zagreb</i>
19.00 – 21.00	<i>Welcoming reception in Conference Hall B at Faculty of Chemical Engineering and Technology, Marulićev trg 19, Zagreb</i>

October 26 (Wednesday)	
8.00 –	<i>On-site registration at Conference info-desk (Congress Hall A) at Faculty of Chemical Engineering and Technology, Marulićev trg 19, Zagreb</i>
9.00 – 10.00	<i>Opening ceremony in Conference Hall A at Faculty of Chemical Engineering and Technology, Marulićev trg 19, Zagreb</i>

Topics: *Sustainable Energy Production and Renewable Energy*
Congress Hall A

Chairpersons: Natalija Koprivanac & Stanislav Kurajica

10.00 – 10.35	Plenary lecture (PL1) MIRANDA SCHREURS Moving towards a Green Economy in Europe: Challenges and Opportunities
10.35 – 10.50	<i>Coffee break</i>
10.50 – 11.25	Plenary lecture (PL2) HEINZ KOPETZ The Future Role of Bioenergy in the European Energy System
11.25 – 11.45	BOJAN RIBIĆ, MONIKA KRUHEK, <u>DINKO SINČIĆ</u> Biogas Production from Organic Part of Municipal Solid Waste. Urban Biogas Project
11.45 – 12.05	<u>LEONARD EKPENI</u>, ABDUL GHANI-OLABI Biogas Improvement through Yeast Use in High Pressure Homogenizer (HPH)
12.05 – 12.25	<u>TOMISLAV PUKŠEC</u>, ZORAN LULIĆ, NEVEN DUIĆ Energy Policy and its Impact on the Long Term Energy Demand Projections of Croatian Transport Sector
12.25 – 12.55	Sponsored presentation by CEMEX Presenter: ALEXANDER RÖDER Partners in Waste Management – the Role of Cement Industry in Waste Management
13.00 – 14.00	Lunch



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<i>Chairpersons: Ljubomir Miščević & Besim Dobruna</i>	
14.05 – 14.40	Plenary lecture (PL3) PETER NOVAK Energy System for Sustainable Development
14.40 – 15.00	MARTA PLAVŠIĆ “Green” Energy of Wind – another View
15.00 – 15.20	POLAT YETER, ÖNDER GÜLER, SEYIT AHMET AKDAĞ The Importance of Wind Shear Coefficient and Air Density for the Estimation of Wind Energy Production
15.20 – 15.40	IGOR BOŠNJAKOVIĆ, MARICA MLINAC MIŠAK Wind Energy Technology Monitoring in Patent Documents
15.40 – 16.00	HALIME PAKSOY, UROŠ STRITIH, HUNAY EVLIYA, VINCENC BUTALA, BEKIR TURGUT, ENEJA OSTERMAN Sustainable Energy Management – Solar Energy and Thermal Storage Technologies
16.00 – 16.20	<i>Coffee break</i>
16.20 – 16.40	K. SUDHAKAR, M. PREMALATHA Life Cycle Analysis and Sustainability of Biofuels in Indian Context
16.40 – 17.00	HEDAYAT OMIDVAR Prospect of Iran Natural Gas Export Projects
17.00 – 17.20	S. AGHAMOHAMMADI SENDANI, K. ABBASPURSANI, A. A. TOFIQ Performance Evaluation of a Typical Vertical Tubular Solar Still
Topic: <i>Soil & Forestry</i> <u>Congress Hall B</u>	
<i>Chairpersons: Alka Horvat & Davor Romić</i>	
15.00 – 15.20	Invited lecture (IL1) GYÖRGY VÁRALLYAY Soil Degradation Processes and Extreme Soil Moisture Events as Environmental Problems in the Carpathian Basin
15.20 – 15.40	H.S. SHIVARAMU, P. RAMANAGOWDA, S.C. RAMESH KUMAR Sustainable Land Use Systems to Prevent Desertification and Increase Food Production on Watershed Approach
15.40 – 16.00	ANTÓNIO CANATÁRIO DUARTE Agricultural Activity, Hydrology and Soil Erosion in a Small Basin, under Mediterranean Climatic Conditions
16.00 – 16.20	<i>Coffee break</i>



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16.20 – 16.40	<u>TAMARA JURINA</u>, NIKOLINA UDIKOVIĆ KOLIĆ, ŽELIMIR KURTANJEK Pesticide Root Zone Model for Agricultural Soils
16.40 – 17.00	<u>MARIE TRANTINOVÁ</u>, VÁCLAV VOLTR Policy of Agricultural Land Protection in the Czech Republic
17.00 – 17.20	VÁCLAV VOLTR Environmental Aspects of the Major Crops Production in Terms of Czech Agriculture
17.20 – 17.40	<u>ANGELIJA BUČIENĖ</u>, AIVARAS BERŽANSKIS Problems of the Development of Sustainable Forestry and Maintaining Soil Fertility in Lithuanian Sea-Shore Region
17.40 – 18.00	KONRAD KIŠ The Development and Current State of Private Forestry in Croatia



October 27 (Thursday)	
8.30 –	<i>On-site registration at Conference info-desk (Congress Hall A) at Faculty of Chemical Engineering and Technology, Marulićev trg 19, Zagreb</i>
Topic: <i>Water & Wastewater Management</i> <u>Congress Hall A</u>	
<i>Chairpersons: Felicita Briški & Hrvoje Kušić</i>	
9.00 – 9.35	Plenary lecture (PL4) DIONYSIOS D. DIONYSIOU Destruction of Cyanotoxins in Water using Homogeneous and Heterogeneous Advanced Oxidation Technologies and Nanotechnologies
9.35 – 9.55	Invited lecture (IL2) LJUBOMIR JEFTIĆ Environmental Management of Transboundary Waters
9.55 – 10.15	Invited lecture (IL3) LASZLO SIPOS, MARINKO MARKIĆ, MARTINA LINARIĆ, TATJANA IGNJATIĆ ZOKIĆ, BARBARA ŠAINOVIĆ, DORA MATIJAŠIĆ Problems of Wastewater Treatment in Coastal Areas
10.15 – 10.35	ALENKA MAJCEN LE MARECHAL, SIMONA VAJNHANDL, JULIJA VOLMAJER VALH, DAVIDE MATTIOLI Water Recycling Implementation in Slovene Textile Companies - Strategy and Results Obtained in the AQUAFIT4USE EU Project
10.35 – 10.50	<i>Coffee break</i>
<i>Chairpersons: Ana Lončarić Božić & Ljubomir Jeftić</i>	
10.50 – 11.10	MARTA PLAVŠIĆ The Importance of the Study of Organic Ligands and Metal Ions for the Management of Marine Coastal Areas
11.10 – 11.30	S. HORVAT, N. VARGOVIĆ, D. RUK, A. LONČARIĆ-BOŽIĆ Enhanced Phosphorus Removal Process in SBR in order to Enhance Phosphorus Removal
11.30 – 11.50	LUCIJA FOGLAR Nitrate Removal in the Continuous-Flow Stirred Reactor
11.50 – 12.10	A. H. KONSOWA, M. G. ELOFFY, Y. A. EL-TAWEEL Treatment of Dyeing Wastewater using Submerged Membrane Bioreactor



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12.10 – 12.30	<u>NORMA G. ROJAS-AVELIZAPA, MARLENNE GÓMEZ-RAMÍREZ, REGINA HERNÁNDEZ-GAMA, MARISOL ZARATE-GARCIA, JORGE ABURTO-ANELL, ROBERTO GARCÍA De LEÓN</u> Obtention of Sulfur-Oxidizing Bacteria with Potential Application in Sulfur-Compounds Polluted Environments
12.30 – 12.50	Sponsor presentation – <i>Silver sponsor</i>
13.00 – 14.00	<i>Lunch</i>
Topic: Waste Management <u>Congress Hall A</u>	
<i>Chairpersons: Zlata Hrnjak-Murčić & Gordana Pehnc Pavlović</i>	
14.00 – 14.20	<u>M. SCOULLOS, C. ZERI, P. SISKOS, A. SKORDILIS, H. ZIOGAS</u> Lessons Learned from the Operation of a MBT Plant in Athens, Greece
14.20 – 14.40	<u>ANDRÉ MARTINUZZI, FRANCESCA MONTEVECCHI</u> EU Research on Waste Reduction Technologies - an Analysis of FP7-Funded Topics, Projects and Networks on Life-Cycle Thinking, Reuse and Recycling
14.40 – 15.00	<u>M. PARTALIDOU, E. TSAGARAKI, T. LIVADIOTIS</u> LIFE+ Recycling Sympraxis Project: an Analysis of the Current Situation in Waste Management and Recycling in Halkidiki, a Mass Tourism Greek Destination
15.00 – 15.20	<u>ADNAN ČEHAJIĆ, JASMINA IBRAHIMPAŠIĆ, ALMA TOPIĆ</u> Current Status and Development of Waste Management System in Bihac Region
15.20 – 15.40	<u>ALEŠ ZVER, ROK MIHELICH, JOŽE PANJAN, SABINA KOLBL</u> Anaerobic Treatment of Waste and Composting and Impact of Land Application of Stabilized Effluents from Wastewater Treatment and Composting Facility on Groundwater
15.40 – 16.00	<u>PAOLA VILLORIA, ANA De GUZMÁN, MERCEDES DEL RÍO, JUSTO GARCÍA NAVARRO</u> Quantification of Construction and Demolition Waste Generated in Spanish Railway Projects
16.00 – 16.20	<u>SILVIU METERNA, BEÁTA MICHNIAKOVÁ, ANDRÁS MUNKÁCSY, IVA OLUJIĆ, IVAN ŠUKER</u> Development of a Harmonized Waste Management System for Inland Navigation along the Danube
16.20 – 16.40	<i>Coffee break</i>
16.45 – 18.30	POSTER PRESENTATIONS
20.00 –	<i>GALA DINNER</i>



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Topics: <i>Air Pollution & Control</i> <u>Congress Hall B</u>	
<i>Chairpersons: Vesna Tomašić & Marija Vuković</i>	
11.10 – 11.30	Invited lecture (IL4) <u>VLADIMIRA VAĐIĆ, SILVA ŽUŽUL, GORDANA PEHNEC</u> Monitoring of Metals in Fine Particles in Zagreb Air
11.30 – 11.50	ANA ALEBIĆ-JURETIĆ Polycyclic Aromatic Hydrocarbons in Suspended Particulates from the Urban Atmosphere of Rijeka, Croatia
11.50 – 12.10	<u>LARS ERIC ØI, AJITH SISIRA KUMARA MUNASINGHE</u> Process Simulation of Water Wash in CO ₂ Absorption using Monoethanolamine
12.10 – 12.30	<u>VILKO MANDIĆ, TANJA OČKO, GORDANA MATIJAŠIĆ, STANISLAV KURAJICA</u> Sol-Gel Preparation, Structural, Textural and Performance Characterization of Mixed Metal Oxide Sorbents for High Temperature Gas Desulfurization
13.00 – 14.00	<i>Lunch</i>
Topic: <i>Water & Wastewater Management</i> <u>Congress Hall B</u>	
<i>Chairpersons: Dionysios D. Dionysiou & Nenad Mikulić</i>	
14.00 – 14.20	DAMIR ŽIBRAT, <u>GORDAN VRBANEC</u> Working Principle and Practical Applications of Ultrasonic Level Transmitters in Water and Waste Water Systems
14.20 – 14.40	KLINPRATOOM PANGYAPING Loading Difference of River Water and Wastewater Discharged to Mae Kuang River
14.40 – 15.00	ALI BERKTAY Wastewater Treatment Processes and their Energy Generation Potential
15.00 – 15.20	<u>PATIPARN PUNYAPALAKUL, KUNTIDA SUKSOMBOON</u> Adsorption and Recovery of Perfluorinated Surfactants from Synthetic Wastewater using Functionalized Mesoporous Silicates
15.20 – 15.40	NASSER ARZANI Modern versus Traditional Technology in Water Harvesting Methodology: Completions and Consequences; Examples from Arid Lands of Central Iran
16.20 – 16.40	<i>Coffee break</i>
16.45 – 18.30	POSTER PRESENTATIONS
20.00 –	<i>GALA DINNER</i>



October 28 (Friday)	
8.30 –	<i>On-site registration at Conference info-desk (Congress Hall A) at Faculty of Chemical Engineering and Technology, Marulićev trg 19, Zagreb</i>
Topic: <i>Education for Sustainable Development</i> <u>Congress Hall A</u>	
<i>Chairpersons: Bruno Zelić & Lidija Pavić-Rogošić</i>	
9.00 – 9.35	Plenary lecture (PL5) MICHAEL J. SCOULLOS Education for Sustainable Development: Evolution – Indicators – Competences with Emphasis on the Mediterranean Countries
9.35 – 9.55	PETER GLAVIČ, REBEKA LUKMAN, MARIJA LESJAK A Comparative Analysis of Universities using Sustainability Indicators
9.55 – 10.15	PIROSKA HARAZIN, KÓSI KÁLMÁN Integrated Approach of Knowledge, Environment and Society Based Performance Evaluation
10.15 – 10.35	ORSOLYA DIÓFÁSI, LÁSZLÓ VALKÓ Training Methods for Purchasing Officers to Facilitate Green Procurement in Hungary
10.35 – 10.50	<i>Coffee break</i>
Topics: <i>Risk Assessment & Management and Environmental Management</i> <u>Congress Hall A</u>	
<i>Chairpersons: Vladimira Vadić & Mark Gero</i>	
10.50 – 11.10	MARIJA BAJICA, SINIŠA TKALČEC, ŽELJKO KOREN Use of Business Intelligence Tools for Decision Support and Forecasting in Environment and Nature Protection
11.10 – 11.30	MARTA BRKIĆ, MARIO POKRIVAČ, TAJANA UZELAC Environmental Impact Assessment Studies Preparation for Coastal and Marine Interventions
11.30 – 11.50	C.D. NWANI, N.S. NAGPURE, RAVINDRA KUMAR, BASDEO KUSHWAHA, PAVAN KUMAR, W.S. LAKRA Assessment of Genotoxic Effects of Carbosulfan, Glyphosate and Atrazine in Freshwater Fish <i>Channa Punctatus</i> using Micronucleus Assay and Nuclear Lesions
11.50 – 12.10	MARIJA BAJICA, SINIŠA TKALČEC, ŽELJKO KOREN A Web-based GIS/IT Application for Biodiversity Mapping and Analysis in Support of Management of Protected Areas in Croatia



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12.10 – 12.30	MARIO POKRIVAČ, MARIJANA BAKULA Environmental Protection Elaborates for IPARD Program, Measures 101 and 103
12.30 – 12.50	ANA ŠIPIĆ, IVANA GRČIĆ, DINKO VUJEVIĆ, NATALIJA KOPRIVANAC Significant Actions of Environmental Impact Assessment, DINA Petrokemija D.D. – Case Study
13.00 – 14.00	<i>Lunch</i>
<p>Topics: <i>Green Economy, Green Chemistry, Green Technologies and Sustainable Building</i> <u>Congress Hall A</u></p>	
<i>Chairpersons: Peter Novak & Franc Lobnik</i>	
14.05 – 14.40	Plenary lecture (PL6) BOGUSLAW FIEDOR Greening the Post-Communist Economies - the Case of Poland
14.40 – 15.15	Plenary lecture (PL7) KEITH SMITH Development of Greener Chemical Reactions
15.15 – 15.35	Invited lecture (IL6) BRUNO ZELIĆ Microreactors – Powerful Tool for Sustainable Process Development
15.35 – 15.55	SANJA TIŠMA, ANAMARIJA FARKAŠ, SANJA MALEKOVIĆ, ANA-MARIA BOROMISA, ANDREA RUK “Small, Green, Competitive Economy” - Croatia's Way to EU
16.20 – 16.40	<i>Coffee break</i>
<i>Chairpersons: Savka Kučar-Dragičević & Keith Smith</i>	
16.40 – 17.00	Invited lecture (IL7) LJUBOMIR MIŠČEVIĆ From Nanomaterials to Self-sufficient Cities
17.00 – 17.20	Invited lecture (IL8) MARK GERO The European Green Building Professional Certification and Training Program
17.20 – 17.40	NEVEN UKRAINCZYK, JURAJ ŠIPUŠIĆ, TOMISLAV MATUSINOVIĆ Calcium Sulphoaluminate Eco-Cement from Industrial Waste
17.40 – 18.00	HAKAN İBRAHİM TOL, SVEND SVENDSEN Optimal Piping Network Dimensioning for Low-Energy District Heating System Connected to Low-Energy Buildings



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Topic: <i>Education for Sustainable Development</i> <u>Congress Hall B</u>	
10.50 – 11.10	Invited lecture (IL5) LIDIJA PAVIĆ ROGOŠIĆ Sustainability as a Global Goal and Education for Sustainability in Croatia
11.10 – 13.00	ROUND TABLE – Education for Sustainable Development Moderators: <i>Natalija Koprivanac, Franc Lobnik, Lidija Pavić-Rogošić, Michael J. Scoullis</i>
13.00 – 14.00	<i>Lunch</i>



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EKO-MONITORING d.o.o.

ZA KONTROLU I ZAŠTITU OKOLIŠA I INŽENJERING



Wednesday, Oct 26 (DAY 1)			Thursday, Oct 27 (DAY 2)			Friday, Oct 28 (DAY 3)		
time	Congress Hall		time	Congress Hall		Time	Congress Hall	
	A	B		A	B		A	B
9'00 – 10'00	OC	-	9'00 – 9'35	PL 4	-	9'00 – 9'35	PL 6	-
10'00 – 10'35	PL 1	-	9'35 – 9'55	IL 2	-	9'35 – 9'55	OL 39	-
10'35 – 10'50	Coffee break		9'55 – 10'15	IL 3	-	9'55 – 10'15	OL 40	-
10'50 – 11'25	PL 2	-	10'15 – 10'35	OL 18	-	10'15 – 10'35	OL 41	-
11'25 – 11'45	OL 1	-	10'35 – 10'50	Coffee break		10'35 – 10'50	Coffee break	
11'45 – 12'05	OL 2	-	10'50 – 11'10	OL 19	-	10'50 – 11'10	OL 42	IL 5
12'05 – 12'25	OL 3	-	11'10 – 11'30	OL 20	IL 4	11'10 – 11'30	OL 43	
12'25 – 12'55	Gold Sponsor	-	11'30 – 11'50	OL 21	OL 29	11'30 – 11'50	OL 44	
13'00 – 14'00	Lunch break		11'50 – 12'10	OL 22	OL 30	11'50 – 12'10	OL 45	Round table
14'05 – 14'40	PL 3	-	12'10 – 12'30	OL 23	OL 31	12'10 – 12'30	OL 46	
14'40 – 15'00	OL 4	-	12'30 – 12'50	Silver Sponsor	-	12'30 – 12'50	OL 47	
15'00 – 15'20	OL 5	IL 1	13'00 – 14'00	Lunch break		13'00 – 14'00		
15'20 – 15'40	OL 6	OL 11	14'00 – 14'20	OL 32	OL 24	14'05 – 14'40	PL 7	-
15'40 – 16'00	OL 7	OL 12	14'20 – 14'40	OL 33	OL 25	14'40 – 15'15	PL 8	-
16'00 – 16'20	Coffee break		14'40 – 15'00	OL 34	OL 26	15'15 – 15'35	IL 6	-
16'20 – 16'40	OL 8	OL 13	15'00 – 15'20	OL 35	OL 27	15'35 – 15'55	OL 48	-
16'40 – 17'00	OL 9	OL 14	15'20 – 15'40	OL 36	OL 28	16'00 – 16'20	Coffee break	
17'00 – 17'20	OL 10	OL 15	15'40 – 16'00	OL 37		16'20 – 16'40	IL 7	-
17'20 – 17'40	-	OL 16	16'00 – 16'20	OL 38		16'40 – 17'00	IL 8	-
17'40 – 18'00	-	OL 17	16'20 – 16'40	Coffee break		17'20 – 17'40	OL 49	-
			16'45 – 18'00	Posters		17'40 – 18'00	OL 50	-
						18'00	CC	-

Legend: OC – opening ceremony; PL – plenary lecture; IL – invited lecture; OL – oral lecture; CC – closing ceremony

CEMEX as the leader in sustainable development

CEMEX Hrvatska shows that operations based on sustainability principles brings benefits to the community

Business philosophy of CEMEX is based on three pillars – environmental footprint management, inclusion of stakeholders and creating value for the society. Environmental footprint management implies constant work on obtaining



excellence in managing environmental protection and protection of local biodiversity as well as improving carbon footprint management. This motivated the company to design its own CO2 emissions' measurement system which pertains to the introduction of alternative fuels, decrease of clinker ratio in cement and increase of production energy efficiency. Its dedication to sustainable development is also shown in plans to recultivate the quarry with indigenous varieties of plant, primarily large olive groves. These groves are tended by members of the local war veterans' association members, mostly CEMEX's employees, who founded a veterans' agricultural co-operative with CEMEX. Co-operative members produce Lintar olive extra virgin olive oil, awarded for quality on several domestic fares. The entire project that comprises inclusion of employees, community and especially socially vulnerable groups was awarded with prestigious Stevie Award in 2011 as the best European environmental program. CEMEX is the company with an attractive

working environment. The company offers range of benefits such as healthcare and above an average salaries, but also great advancement and education opportunities and advantages of knowledge and experience sharing throughout the global



group it belongs to. Furthermore, health and safety systems influenced vastly the decrease of work injuries and improved working conditions. Its favorable HR practices earned CEMEX 2010 award from "MojPosao" web portal and it is considered one of the most desirable Croatian employers.



Good relations with the community is maintained through many donations for worthy project CEMEX awarded over the years via its donation tender, while its annual Open Door Day is a gathering readily visited by many neighbors and children

from local schools. CEMEX also works on education advancement of all age groups, from cooperation with local eco-elementary schools, organization of student practices to special CEMEX Student project awarding the most perspective future construction engineers. Especially dedicated to the development of construction and architecture, CEMEX awards annual Building Award to the most innovative designs and implementations. Its efforts in improving its internal and external conditions earned CEMEX three consecutive CSR Index awards presented by CBCSD and Croatian Chamber of Economy.



With all that said, CEMEX does not forget its clients and business partners, aiming to offer a wide variety of innovative products designed for more specific construction needs, all along taking care of sustainable construction promotion. In all activities it undertakes, CEMEX aims to be a good citizen of the world, investing knowledge and work into securing sustainable operations, safe workplaces and new ideas for the future of building.

