3rd International Holcim Forum for Sustainable Construction

Mexico City, April 14 – 17, 2010
“We must go beyond traditional building techniques. We have to look a bit to the left and right.”

Werner Sobek
Rethinking the way we build

The global community stands before a great challenge: to reorient itself economically, ecologically, and socially. This process includes construction; the way we build must be reinvented and aligned with principles of sustainable development. For future generations to be in the position to meet their needs, the traditional approaches to designing, constructing, and using buildings and structures must change significantly. Optimizing individual components is no longer sufficient; an integral approach and radical change are necessary – change in every phase of the life cycle of buildings.

To discuss the rethinking of construction – and to inspire steps forward by the discussion – the Holcim Foundation for Sustainable Construction invited 270 specialists from 39 countries to Mexico City for the 3rd International Holcim Forum. For three days the architects, engineers, urban planners, natural and social scientists, and representatives of business, politics, and society collaborated in workshops, exchanged their views in panel discussions, attended technical presentations, and sought ways, both established and new, to translate forward-looking theoretical approaches into practice.

The Holcim Forum also promoted intensive and personal exchange among the specialists – squarely in the sense of sustainability, because a breakthrough for sustainable construction can be achieved only through close and interdisciplinary cooperation as well as holistic thinking.
Symbol for challenges and solutions
Rethinking is possible, and the people of Mexico City prove it. They must cope with tremendous challenges – and constantly find new solutions for urgent problems.

The choice of Mexico City as the Forum location was no coincidence. The Holcim Foundation, organizer of the Holcim Forum, collaborates with a leading technical university in each world region. The 1st Holcim Forum on the topic Basic Needs was held in 2004 at the Swiss Federal Institute of Technology (ETH Zurich), Switzerland, and the 2nd on Urban_Trans_Formation in 2007 at Tongji University (TJU) in Shanghai, China. Next in line was Universidad Iberoamericana (UIA) in Mexico City – a perfect place to contemplate the future of construction. After Tokyo, it is the world’s second largest metropolitan region. It demonstrates impressively why rethinking is necessary, because the city faces uncounted critical challenges. 4.5 million automobiles are on the road every day, and because Mexico City is situated on a plateau surrounded by mountains – a setting which prevents adequate air circulation – smog forms continuously. The World Health Organization (WHO) ranks the air quality of Mexico City among the worst in the world.

Social and economic problems exacerbate the city’s troubles and are accentuated by heavy immigration. A third of the urban population lives below the threshold of poverty. But Mexico City is not simply a prototypical collection of contemporary problems – it also shows that challenges can be mastered. The city has been battling pollution for years, with visible success. The government issues selective traffic bans, promotes the use of low-lead and low-sulfur fuels and, through ever-tightening legislation, sees that industry and domestic households are becoming cleaner. Through uncounted individual initiatives the many squatter districts are gradually becoming consolidated. And economically, more and more citizens are becoming increasingly better off.

Mexico City is therefore a symbol of both: the challenges of the 21st century and the power of the community to tackle these challenges – and to master them through hard work. Thus the city presented an ideal backdrop for deliberating the future of sustainable construction.
Hosts of the Forum

José Morales Orozco (Mexico), SJ, Rector, Universidad Iberoamericana.

Sara Topelson de Grinberg, Under-Secretary of Urban Development and Land Planning, Government of Mexico.
The media showed great interest in the Forum. Pictured: Eduardo Kretschmer, CEO of Holcim Apasco, the Mexican Group company, gave a TV interview during one of the breaks.
No more inefficiency
American physicist Amory Lovins, Founder and Chairman of the Rocky Mountain Institute, lives not in utopia but in the here and now. Accordingly, his proposals for how to create a more sustainable world are realistic. Carrying them out, however, requires that we jettison our old habits and ways of thinking – and adopt instead integral thinking.

“When it comes to energy policy, government and the media often present us with a stupid multiple-choice test,” said Amory Lovins: “Were the question put clearly, it would be something like this: Would you rather die from global warming, oil war, or a nuclear disaster?” Lovins marked none of these three choices as correct: “I want nothing of this!” Instead, he wants a world that doesn’t run on oil, coal, or nuclear energy, “because energy is being used to save money – instead of to cost money.”

Lovins sees light-handed energy measures as completely insufficient because climate change demands totally new approaches. “If we start today to reduce energy consumption by one percent a year, in 2100 we will still all be toast,” he warned, and asked why it seems to be so hard to stop wasting energy. More and more energy is being consumed in countries like China and India, where completely new infrastructure is arising that could take advantage of the newest technology. “Building things properly from the start is much easier than fixing them later,” told Amory Lovins. “I’m getting tired of upgrading buildings that somebody else designed inadequately.”

“In conventional practice, the more you save, the more it costs you.”

In his presentation, spiced with wit and optimism, Lovins dealt primarily with two energy sources: oil and electricity. In 2004 his team wrote a study mandated by the Pentagon called “Winning the oil end game.” The study shows how oil consumption in the USA could be eliminated by 2040 by making automobiles and airplanes lighter and more effec-
Lovins’ team designed an SUV that is much lighter, much more efficient (with its hybrid motor), and significantly safer than conventional models. He sees the car of the future made mainly of carbon fiber; the material is more expensive but it is ultra light and very strong. Toyota has already designed a carbon fiber car that offers the same room as a Prius at a third of the weight, and accordingly requires much less fuel. “If we would build all our cars and light trucks in this way, it would be like discovering a second Saudi Arabia under Detroit,” said Lovins, “because the USA alone could save that much oil.”

“We can triple the efficiency of cars, trucks, and planes without compromise and with better safety by making them lightweight and more aerodynamic and equipping them with advanced propulsion.”

Lovins sees enormous savings potential in electrical power consumption. In the USA some 70 percent of all electricity is used for buildings. Today the market offers countless innovative technical devices that can be elegantly incorporated into building renovations. But more important than any technical aid is the correct key concept – “integrative design,” said Lovins. The scientist drew an easy-to-understand comparison with cooking: “You can’t just take the ingredients, no matter how good they are, throw them in a pot, add heat, and wait for a wonder to happen. You need a good recipe that tells you which ingredients in which order are to be prepared in which way – only then will the dish taste good when it is served.”
Rolf Soiron, one of the Forum hosts, presented all keynote speakers with a Freitag bag, made out of used truck tarpaulins, recycled bicycle inner tubes, and old car seatbelts. The environmentally friendly and virtually indestructible all-purpose bag has become Zurich’s most famous fashion icon and has been displayed at the New York Museum of Modern Art.
“Optimizing not building components but whole buildings as systems delivers high efficiency and yields the expected return on investment – and of course the lowest-risk investment is the one you don’t need to make.”

As an example of a building created with a good recipe he cited his own house, situated 2,200 meters above sea level in the Colorado Rocky Mountains. Such a location is a great challenge for engineers because the temperature differentials are extreme. Nonetheless, Lovins’ home and workplace requires no fossil fuels, is 99 percent solar heated, and has no conventional heating or air-conditioning system. The building technology he used has been available for a long time, and the energy-saving construction is also no financial feat – because the cost is quickly amortized, said Lovins. He also mentioned the current renovation work on the Empire State Building in New York, which is being fitted with new high-performance windows that let in more light but less heat – helping cut the cost of cooling the building by a third. New glass technology is also being used at the Twin Towers of the Deutsche Bank in Frankfurt to better transmit and distribute daylight and thereby reduce lighting energy.

If new technologies show such unequivocal advantages, why haven’t they gained wide acceptance? “Because in conventional practice one still hears that the more you want to save the more it’s going to cost you,” believes Lovins. But the case is different if you optimize a building as a total system rather than optimizing individual components. In doing so, one must beware of “infectious repetitis,” and not rely on trusted rules of thumb, but instead measure and analyze the relevant
conditions. Efficiency down to the smallest detail is the motto of the physicist. Because the more (mostly low-cost) details you optimize, the more efficient the (cost-intensive) larger upgrade becomes. And in the end, that means the upgrade pays off quicker.

“This is the lean-thinking element, no rules of thumb – you actually measure things and do analysis, no infectious repetitis – this means we don’t just copy the old drawings. And no incrementalism.”

Ultimately, the crux is to create a modern energy system – from the smallest innovation to revolutionizing our use of oil and electricity. Lovins is convinced that “there must be more modern ways for an industrialized society to meet its energy needs than by burning primeval swamp deposits and dinosaur excrement.” But at the same time, he is aware that the adherents of conventional thinking are still many: “Not all fossils have become fuel,” he quipped.
An empathetic civilization – now
It has long been evident that mankind is destroying his life-sustaining resources – yet actions to counter this development are slow to come or lacking entirely. The American economic writer Jeremy Rifkin is nevertheless optimistic and convinced of a new trend. Because mankind can count on a characteristic that he has always had: empathy.

“Humans are a relatively young species that makes up just half a percent of the biomass on the earth – yet we consume about 24 percent of the products of photosynthesis of our planet.” With these sobering and striking numbers Jeremy Rifkin opened his fiery speech.

“It is a monstrosity,” Rifkin called out into the hall, “we are devouring this planet!” We are pulling ourselves into the abyss through our own actions. Considering this state of affairs, Rifkin finds it incomprehensible that the representatives from 192 countries at the Climate Summit held in Copenhagen in 2009 could not agree on effective actions. “What is wrong with us?” he asked – and immediately answered: “I believe we are living by obsolete notions from the 18th and 19th century. With this mindset we will never succeed in mastering the challenges we face today.”

“It’s that existential sense of the unrepeatability and the fragility of life that allows one to empathize with others.”

In early times, man looked to the heavens, and in the age of industrialization, to the nearby surroundings, where factories stood. “Today,” said Rifkin, “our view must become more comprehensive.” The internet has already caused individuals to perceive mankind as their extended family. As examples of this, Rifkin cited the global responses to the earthquake in Haiti and the student protests in Iran. “In such an age as ours, it must be possible to establish a worldwide civilization based on empathy.”
Empathy is the ability to feel along with others and to place oneself in their situation. There are indications that empathy is part of our genetic code. Studies of so-called mirror neurons show that, for instance, whether a monkey watches a human try to open a nut or opens the nut itself, the same neurons are activated in the monkey’s brain.

“If we want a sustainable society, we have to cultivate an empathic civilization.”

For advanced species there is apparently no way to ignore empathy. If it is suppressed, aggression, violence, narcissism, and other forms of harmful behavior gain the upper hand, said Rifkin. In the age of hunters and gatherers, empathy was limited mainly to the clan sharing a
“When one species devours a quarter of the products of photosynthesis of a planet, we must ask the question: Can this planet hold us? Either we’re gonna go, or other species are gonna go, or we’re gonna learn to live with each other. It’s as simple as that.”

domain. As mankind spread out and clans became allied, the “we feeling” expanded to cover a larger group defined by religious or national ties. Now that “we feeling” must be expanded once again – to the entirety of mankind.

Jeremy Rifkin asked: “Can we imagine a new form of energy or communication that in less than two generations could take us from psychological or ideological consciousness to biosphere consciousness?” He believes that the last great communication revolution, the internet, could help us achieve biosphere consciousness, a sort of global comprehensive empathy.
Regarding a third Industrial Revolution, the European Union is committed to a four-pillar strategy. Jeremy Rifkin played a significant role in the development of this “economic action plan.” Pillar 1 is renewable energy, which by 2020 the EU member states aim to use for a third of their needs. Rifkin sees decentralization as the way: “If renewable energy is available on every square centimeter of the earth’s surface, why collect it at just a few central points?” That question leads to Pillar 2: “Buildings, buildings, buildings!” Every building must become its own power plant, believes Jeremy Rifkin. “We should rethink our notion of what a building is. A house must be at once a residence and a power plant.” Micro power plants however carry a certain risk. For instance, what would happen if summer 2020 in Europe were to be very hot, continuously cloudy, and windless? Rifkin presented this scenario to Romano Prodi, former president of the EU Commission. At first Prodi was perplexed, and later he approved a budget for researching energy storage – Pillar 3. “I am strongly in favor of storing all forms of energy,” says Rifkin.

“As we begin to completely reconceive buildings to serve dual purposes – both a dwelling and a power plant – we will jump-start the European economy.”

“When the energy revolution converges with the communication revolution it will create a fundamental change in human consciousness. It will set up a whole new frame of reference for how people live together.”

In Pillar 4 the communication revolution meets the energy revolution. Rifkin put it in a striking way: “This results in distributed capitalism – because everybody becomes their own entrepreneur and, we hope, develops biosphere consciousness.” Rifkin told of a technology that has been in development for seven years. Millions of micro power plants
“If we can learn that lesson, if we can create biosphere consciousness, if we can create an empathic civilization, we will have a sustainable future and we will have a legacy worthy of our time. It’s up to the folks in this room who are at the cutting edge of their fields to help us get there, very quickly.”

will be linked, as computers are linked by the internet. Whoever has surplus energy sells it to the network, and whoever needs energy buys it from the network. Thus empathy, the “we feeling,” becomes a fundamental part of energy management.

A team is currently developing such a concept for Rome. “We want to make the first large city in Western civilization into a biosphere city,” said Rifkin. One day even the Colosseum will produce its own energy. At first the large network will link Romans among themselves, but Jeremy Rifkin is convinced that eventually it will link all of mankind: “When we become a single family of man, unified in empathy, we will have a sustainable future.”

Jeremy Rifkin is President of the Foundation on Economic Trends (FOET) in Washington, D.C., USA, a nonprofit organization that examines emerging trends in science and technology and the associated impact on the environment, economy, culture, and society. Rifkin was an advisor to French, German, Portuguese, and Slovenian political leaders during their respective European Council presidencies on issues related to the economy, climate change, and energy security. He currently advises the European Commission, the European Parliament, and several EU heads of state, and has been influential in shaping public policy in the US and around the world. Jeremy Rifkin is the author of numerous books on the impact of scientific and technological changes on the economy, workforce, society, and environment.
Nothing stands alone
American architect Thom Mayne sees buildings not as isolated works but as contextual elements. For him, “Re-inventing Construction” means that every building must be considered in connection with its function, its users, its surroundings, and the environment. This multifaceted perspective leads to complex architecture that is typical of Mayne’s work.

“When I began working as an architect,” recounted 66-year-old Thom Mayne, “there was a division between those who celebrated architecture as an art and those who were part of a budding environmental movement happening mainly at Berkeley and MIT.” However, he admitted, this green movement in architecture had less to do with architecture and more to do with engineering – “and it produced,” laughed the architect, “some quite hideous buildings.”

Mayne’s first large design project was a school in Pasadena, California. The vision of Morphosis, the architecture office founded by Mayne and Michael Rotondi in 1972, was to develop an architecture that transcends traditional formal language. In a way, the school was Mayne’s first environmentally conscious statement: “I wanted everything to be responsive to the changing climate.” After that project Mayne took a different direction. He abandoned the single-mindedness of his original intention, and for the next 20 years explored the breadth of what architecture means to him. He generated new notions of edges, borders, and building envelopes. “It had to do with the relationship between inside and outside, between protected environments and nature.”

“As a global culture, we seem to be just realizing the vital nature of this process of realignment.”

Simultaneously, Mayne dealt with urban design concepts – how buildings react on and with their surroundings – and his architectural works became an interpretation of context. 15 years ago, when Thom Mayne
was commissioned to design a commercial building in Seoul, he again started to deal intensively with the idea of the building skin, with the question of which layers the building should consist of, and how the building should respond to its environment. The project was strapped by financial constraints and regulations. Mayne says that unsatisfactory general conditions have become the greatest problem of architects. “Fortunately, at that time we were already advanced enough with computer technology to deal with far more complex concepts for building skins.” Mayne handled the building as part of the urban fabric and developed its relationship with the environment. Using transparent and translucent materials, he created a building that changes appearance with the time of day and the season of year.

“Architects deal with many concerns and forces; the relationship with the environment has increasingly become a preoccupation.”

Morphosis’ design for the Hypo-Bank in Klagenfurt, Austria, furthered this concept, based on dynamics and interaction. “The issue here was not an individual building,” explained Mayne, “but rather a sort of urban ensemble.” Our relationship with the social environment has changed just as our relationship with the natural environment has. Because European architecture is quite different than American architecture, Mayne and his team took home many completely new ideas.

“I am fighting for architecture to become more responsive, synthesizing multiple forces including social, political, infrastructural, urban, and environmental.”
“Architecture is shifting from a mechanical paradigm to a biological one.”

“I have been fighting for a long time to see that architecture finally becomes a synthesis of various forces: social, political, infrastructural, urban, environmental,” said Thom Mayne. “Today in architecture we are seeing a paradigm shift away from the mechanical and toward the biological,” said Mayne, by which he meant “fortuitousness, even insignificance in a biblical sense. Random behavior fascinates me.” This fascination is expressed, for example, in multilayer building skins with urban, social, or environmental functions, depending on the need.
Mayne calls a building by Morphosis in San Francisco “a strategic rather than an architectonic project,” one in which “everything except aesthetics” is important. Taking advantage of the mild San Francisco climate, the indoor ventilation is controlled primarily through open spaces. Regarding social performance, an event base was created, and offices were located strictly according to functional criteria, completely ignoring the management hierarchy. “For once, we have placed function above status,” said Mayne. The indoor climate can be centrally or individually controlled. “I think it’s important that people have control over their own environments,” told Mayne, with amusement: “but this seems to be abnormal in America. People are not used to opening windows anymore. We had to supply window operating instructions.”

“From the beginning of time, the facade had to do with proportionality. The whole notion of facade is starting to shift – it’s no longer about proportionality, it’s about associationship.”

The interaction between the micro and macro also inspires Thom Mayne. Phare Tower in Paris, another Morphosis project, will be the workplace for 20,000 people when it is completed in 2012. The 300-meter high-rise is just a few centimeters shorter than the Eiffel Tower, and it will take on a different appearance from every perspective – and thereby accentuate the complexity of the city in which it stands. “That’s typical for us,” said Mayne: “Le Phare too should be not an isolated building but rather part of an urban ensemble, connected with its environment.” No two floors will be alike, a wind generator will be on the roof, and 3,500 different materials will be used for the building skin.
Thom Mayne is Principal of the architectural firm Morphosis, founded in 1972, with offices in Los Angeles and New York, USA. His buildings, typically clad in textured metal or concrete, have been described as seemingly unfinished and in motion. Thom Mayne was awarded the Pritzker Prize in 2005, widely considered the “Nobel Prize of architecture.” His works include the new academic building at Cooper Union in New York; Cahill Center for Astronomy and Astrophysics at California Institute of Technology in Pasadena; Hypo Alpe-Adria Center in Klagenfurt, Austria; Sun Tower in Seoul, South Korea; and the wind-powered office building Tour Phare at La Défense, Paris. Thom Mayne was a Member of the Holcim Awards jury for North America in 2005 and the Global Holcim Awards jury in 2006.

“There is no such thing as nature in the 19th century sense of the word. We all live in augmented nature.”

“Today every building must be multifunctional; designing for a single purpose is no longer enough,” told Thom Mayne. “Buildings must convince us nowadays, win us, take us to another place.” That might sound like it goes without saying – but doesn’t, as shown by the Hyatt Foundation’s awarding Mayne the Pritzker Prize in 2005, praising him for his “rebellious spirit and passion for change.”
Reduce to the max
German engineer Werner Sobek is a specialist for lightweight construction and he is a man of reason. Rational thinking demands that one sees exactly how much energy and material a building consumes throughout its lifecycle – because savings in one place can often lead to significant costs in another.

The construction industry has a great task ahead if the world is to be saved from suffocation. Construction consumes not only half our natural energy resources; it produces half the world’s waste. “It’s obvious,” deduced Werner Sobek: “we must reduce the amount of material we use for buildings.”

Many of Sobek’s projects illustrate new approaches to material use because he is a specialist for lightweight materials, lightweight structures, and lightweight systems. Lightweight materials provide the greatest strength for the least weight. Lightweight structures are ultra-light static frames and envelopes. Lightweight systems deal with functional aspects; an airplane wing, for example, must be at once light, strong, and flexible – and provide space for fuel tanks.

Sobek presented two examples of lightweight systems. The first is a project called “La couverture des Arènes,” located in Nîmes, southern France, a project he completed shortly after he graduated. The roof over the Roman arena is a pneumatic structure, 16 meters wide by 90 meters long. The membrane is only one millimeter thick, yet the structure reliably withstands strong local winds. The second example is the German Post center in Bonn; the arch-and-rib structure minimizes weight and maximizes multifunctional space.

“If we talk about resources and resource consumption, it’s quite obvious that we have to reduce the amount of material we use in buildings.”
Besides frugal use of resources, recycling is another way to reduce waste. In the construction industry, recycling is a thorny challenge. It takes great effort to reuse many of the materials that go into buildings because they are typically bonded or fixed to other materials and thus difficult to separate. The German automobile industry is mastering this problem. The carmakers’ recycling rate is a good 85 percent; Mercedes Benz sometimes achieves even 95 percent. New technologies could help also the building industry achieve higher

“...the other way is to build as light as possible, reduce gray energy as much as possible, minimize energy consumption over the entire lifetime, and have a close look at what’s left over.”

Werner Sobek advocates a philosophy of reduction. He calls for lower consumption of materials and fossil fuels – and less attachment to old ways.
recycling rates, “but to do it, one must choose alternative construction methods,” told Sobek. Magnetic, hook-and-loop, and socket connections are potential approaches.

As an example of a completely recyclable building, Werner Sobek presented a newly erected structure: the protective envelope for Station Z, a commemorative site on the grounds of the former concentration camp in Sachsenhausen, Germany. The free-span steel-frame structure is covered with a total of 500 kilograms of textile, stabilized by simple air pressure, regulated by a small pump. Sobek explained the unusual design: “We sought new approaches and building methods that would allow us to build in such a way that later everything can be easily dismantled and removed.” Today we really don’t know what the generations of tomorrow will need or find attractive, said Sobek, “so the buildings we build today must be able to be removed in a good way tomorrow.” Sobek also knows, however: “Of course the issue is sustainability, but it is always a question of beauty too – because without breathtaking beauty people would never accept sustainable buildings.”

Werner Sobek names energy management as another important challenge for the construction industry: “By linear extrapolation, our natural oil resources will last perhaps another 25 years. You don’t have to be a scientist to figure out that this will cause more than a catastrophe.” And linear extrapolation is overly optimistic anyway,
because mankind is consuming increasingly more oil. Thus the declared intention must be to massively curb energy consumption, “also because we have far better things to do with oil than burning it; we need it to manufacture pharmaceuticals, plastics, and much more.”

“I think we as architects and engineers are not in the position to predict what future generations will need and love. So the buildings we design today should be able to be removed in a good way tomorrow – and that means one hundred percent recyclability.”

Sobek is critical of saving energy by wrapping buildings in thicker and thicker insulation: “You have to compare the energy you save by using thicker insulation with the energy you expend to build up the insulation layer. Sometimes we completely ignore gray energy.” It makes much more sense to build the structure lighter and place the insulation within the structure itself – for instance, using blocks with cavities that can be filled with insulating foam.

The airtight super-insulated house with life-sustaining ventilation machinery is in Sobek’s eyes also an unappealing prospect: “I don’t want to live in something like that; it makes one depressive.” He pleads rather for “active buildings,” buildings that collect all forms of energy that nature delivers free to the doorstep – and then use the energy directly. As an example, the engineer cited “La Cité du Design”
“Sustainability in architecture will not be broadly accepted unless it offers breathtaking beauty.”

in St. Etienne. The gigantic multifunctional space is enclosed by an outer skin comprising 14,000 triangular elements that perform special functions. They not only protect the building against wind, water, and the heat of the sun; they generate energy. “Such technologies, combined with lightweight construction methods, point in the right direction,” said Sobek. “And this path is absolutely feasible!”

Werner Sobek is Principal of Werner Sobek GmbH and Director of the Institute for Lightweight Structures and Conceptual Design (ILEK), University of Stuttgart, Germany. ILEK specializes in the research of new materials and new concepts for lightweight and adaptive structures. Werner Sobek GmbH focuses on the design of construction elements and concepts for sustainable buildings including special structures in steel, glass, titanium, concrete, textiles, and wood. He has received the DuPont Benedictus Award, European Gluelam Award, Fritz Schumacher Award, iF Design Award, SEAOI Structural Engineering Award, AIA Awards, Hugo Haering Award, Fazlur Rahman Khan Medal, and the UIA’s Auguste Perret Prize. Werner Sobek has been nominated as a Member of the jury of the Global Holcim Awards 2012.
Re-inventing yourself
Mexican architect Michel Rojkind approaches people with great enthusiasm, recognizing that one needs constant contact with others to develop oneself, and that mutual influence can lead to many opportunities. “We want to bring people together, jointly get new things started, and in this way create something good,” said Rojkind.

“People have always been afraid of contact with others – it’s fear of the unknown,” said Michel Rojkind as he began his speech. “Especially in the past 50 years there has been a sort of puritanism, cloaked as hygiene.” As a Mexican, he is particularly conscious of the importance of contact with others – on one hand, because close contact is unavoidable where he lives, in Mexico City, and on the other, because Mexicans habitually embrace each other as a social gesture.

“Being in contact with others, however, remains a constant challenge,” said Rojkind. Even maintaining contact with oneself can be challenging at times. Humans always tend to decide on a certain course of action, although sometimes it might be better to go several ways at once. That’s why the 41-year-old had no problem starting out simultaneously as an architect and drummer – even though many of his professors advised him to concentrate on one profession or the other.

“We love design, regardless of scale – big or small – we love design.”

True to his philosophy of “always new,” in his first architectural partnership Rojkind tried not to be restricted to a single area. Still, the work routine became too comfortable, and he decided to separate from his partner and seek a new direction. Michel Rojkind presented several projects which prove that such a step into the unknown can be exceptionally productive. He collaborated with the Dane Bjarke Ingels on the New Tamayo Museum in Mexico City. “We discussed the project by Skype, and when we were asleep here in Mexico, we knew that our colleagues in Denmark were hard at work. At the end of their day the project came back to us and we con-
continued the work.” Just as diverse as the team behind the project were the requirements for the building, which serves as a museum and an art storage facility. Bjarke Ingels confirms: “It was exciting to see the Mexican context from the perspective of a Dane.” The design task was like that of any museum – to harmoniously merge the artists’ wishes for sleek and functional spaces and the museum director’s desire for an iconic building. Yet beautiful architectural concepts must always be rooted in reality, as the team of architects came to acutely feel at a certain point. Rojkind: “Now the museum had everything – except for a site.”

“That’s what I like about sustainability – it’s not only about how much energy you save, it’s also about what you’re giving back to the city.”

Rojkind presented a second Mexican project, a building for the food company Nestlé – another example of how seemingly unpromising contact with others can lead to satisfying results. The competition brief merely called for an access road for school buses to reach a Nestlé chocolate factory. “We did some research and found out that there was no chocolate museum in Mexico City. That’s absurd, considering that the Aztecs were the inventors of chocolate.” So Rojkind brashly proposed to expand the project by adding a museum. His argument: It’s a way that the company can give back something to the people. “That’s also an aspect of sustainability,” says Rojkind. Nestlé accepted his proposal under one condition: the building had to be finished within two and a half months. “We worked three 8-hour shifts per day,” told Rojkind. “We explained the work to the first shift, then to the second, then the third, and then the cycle repeated. And we had to work with materials that were available because there was
"We’re a generation that doesn’t want to become specialists; we love to get people together and work together."

simply no time to order anything else. We did the landscaping with what was left over on the construction site.”

Rojkind loves not only the challenge but also the risk, even though he has suffered misfortune with this penchant. He recounted an episode in Kuwait: four firms were flown in for a design competition; the stay was not even 24 hours. Afterwards, years passed, and finally the four competitors began sending each other e-mails to find out who won. It turned out that the entire exercise was pure speculation.

“I always talk about digital design but local labor.”

“I swore to myself to never again work for this client,” told Rojkind – “but I didn’t remain firm.” The second project with the same client also turned out to be a hollow proposition in the end. “Experiences such as these show me how important it is to seek contact and exchange with others. We are part of a generation of architects who no longer want to be specialists. We want to bring people together, jointly get new things started, and in this way create something good. The better you know the strengths and weaknesses of others, the better your chances are to form teams that can create valuable projects.”

Michel Rojkind is Founder and Principal of Rojkind Arquitectos, based in Mexico City. The company was recognized by Architectural Record as one of the leading ten “Design Vanguard” firms in 2005. Michel Rojkind’s work seeks new directions in architectural practice by evoking common identities through the exploration of uncharted geometries that address questions of space, function, technology, materials, structure, and construction methods related directly to geography, climate, and local urban experiences. His Nestlé Chocolate Museum in Mexico won the International Architecture Award (2008) as one of the world’s best realized designs and it was nominated for the British Museum Award (2008) for the ten best buildings of 2007. Rojkind will be a Member of the Holcim Awards jury for Latin America in 2011.
“Re-inventing Construction” is an interdisciplinary challenge that spans the globe, and the field of participants at the 3rd International Holcim Forum was accordingly diverse. The group photo gives outstanding evidence: The architects, engineers, urban planners, construction specialists, economists, students, politicians, and sociologists who convened for three days turned Universidad Iberoamericana (UIA) in Mexico City into a worldwide focal point for sustainable construction.
“Many things have become easier. The clients have changed; because sustainability is now more established, clients must no longer be a hero when they want to do something for the future.”
G

Gamboa de Buen Jorge, Mexico
García Joel, Mexico
Gastelum Gustavo, Mexico
González Benjamín, Mexico
González Pablo, Mexico
Gow Marcelyn, USA
Grinberg José, Mexico
Guevara Alejandro, Mexico

I

Ingels Bjarke, Denmark
Intrachooto Singh, Thailand
Irurah Daniel, South Africa

J

Janesch Péter, Hungary
Jiangning Sun, China
John Vanderley, Brazil
Jorisch Philippe, Switzerland

K

Kakabadse Yolanda, Ecuador
Kantilal Ashvinkumar, Singapore
Karlsson Ulrika, Sweden
Keller Cristina, Mexico
Kennedy Sheila, USA
Knechtli Mia, Switzerland
Kojima Kazuhiro, Japan
Krank Sabrina, Switzerland
Kretschmer Eduardo, Mexico

L

Lahbabi Abderrafih, Morocco
Lall Ashok, India
Lares Jaime, Mexico
Larsson Magnus, Sweden/UK
Léal Fernández Felipe, Mexico
Lee Gabriela, Mexico
Leeman Ranidia, Indonesia
Leibacher Peter, Switzerland
Leibundgut Hansjürg, Switzerland
Lepore Raffaella, South Africa
Leung Samantha, USA
Leutenegger Marius, Switzerland
Lignano Giuseppe, Italy/USA
Lim Yu Sing, Indonesia
Lipkau Gustavo, Mexico
Lirusso Alejandro, Mexico
Loomes David, USA
Love Andrea, USA
Lovins Amory B., USA
Lu Hui, China

Günter Meinert, Senior Urban Specialist, GTZ and Cities Alliance, USA/Germany.

“Unfortunately, there are no single actions that could lead to a breakthrough for sustainable construction. Sustainability is not as simple as that. Because intervention opportunities exist at all levels, change must be effected everywhere: in awareness, in sensitizing, in society’s frameworks, in competencies, and in knowledge.”

Holger Wallbaum, Professor of Sustainable Construction, ETH Zurich, Switzerland.

“Our discussions often bypass the reality of life. We can afford to think in the abstract, but many people are living hand to mouth and are immensely vulnerable. We must be very careful when we deal with squatter towns – and have no unrealistic aims of trying to create blossoming cities.”


“We need politics with long-term vision. We must help residents of squatter towns to improve their situation step by step.”
“If we change the construction industry, certain jobs will be lost and money streams will be diverted. Unfortunately, there are still many parties with interest to keep things as they are. Our greatest challenge is personal interests.”

“Alicia Medina, Student, University of British Columbia, Canada/Mexico.

“We still lack an integral approach. People must be integrated more strongly — when they receive a green building, they might misuse it because they weren’t involved in the development.”

“Mona Serageldin, Vice President, Institute for International Urban Development (IIUD), USA.

“Our task is to improve people’s living situations. Architectural wonders solve no real problems.”

M

M’jahdi Mohamed, Morocco
Macdonald Marie-Paule, Canada
Madinabeitia Sergio, Mexico
Mancera Elizabeth, Mexico
Manteca Florencio, Spain
Martínez Francisco, Mexico
Martinez Leonardo, Mexico
Martinkó József, Hungary
Mazari Hiriart Marcos, Mexico
Medina Alicia, Mexico/Canada
Meggers Forrest, Switzerland
Meinert Günter, USA
Meléndez Sergio, Mexico
Mendoza Alejandro, Mexico
Mier y Terán Arturo, Mexico
Mokoka Lomile, South Africa
Montañana Delfín, Mexico
Montiel Rozana, Mexico
Morales Gerardo, Mexico
Morales Orozco José, Mexico
Morón Rubén, Mexico
Mueller Thomas, Canada

N

Nava José Maria, Mexico
Niño Martha, Mexico
Nizet Baudouin, Canada
Noriega Pilar, Mexico
Norten Enrique, Mexico/USA
Novák Agnes, Hungary

P

O’Dogherty Madrazo Rocío, Mexico
Olivier Bernard, Canada
Ordóñez Juan Felipe, Mexico
Ortiz Struck Arturo, Mexico
Oswald Franz, Switzerland
Oswald Monika, Switzerland

Pacheco Nadia, USA/Mexico
Pearl Daniel, Canada
Pedreira Livia, Brazil
Pedreira de Lacerda Marina, Brazil
Pérez Virginia, Mexico
Picciotto José, Mexico
Pizzarro Rocío, Mexico
Pocaterra Isabel, Venezuela
Prado Galán Javier, Mexico

Q

Qian Chuan, China
Qin Menghao, China

R

Raman Mahadev, USA
Ramírez Jorge Alvaro, Colombia
Ratanapridakul Kanika, Thailand
Reed Bill, USA
Render Duanne, South Africa
Reyes Aldasoro Carolina, Mexico
Riedi Janine, Switzerland
Rifkin Jeremy, USA
Rockcastle Siobhan, USA
Rojkind Michel, Mexico
Rose Virginie, Mexico/France
Rossi Gabriella, Brazil
Rot Nikkol, Switzerland
Ruby Andreas, Germany
Ruby Ilka, Germany
Daniel K. Irurah, Senior Lecturer, University of the Witwatersrand (Wits), South Africa.

“We have since gained the technologies – now the task is to see that the key decision-makers push these technologies.”

Harald Sternberg, President, HafenCity University Hamburg (HCU), Germany.

“The architectural and the engineering communities still collaborate with each other too little; coming together is apparently not so easy for either group – although the broad population definitely wants to see a breakthrough for sustainable construction.”

Yu Sing Lim, Architect, Genesis Architects, Indonesia.

“We must strengthen the dissemination of information. This Forum has shown me once again how diverse the subject of sustainability is – so we still have much work to do to achieve clear understanding.”

S
Salinas Gerardo M., Mexico
Sánchez Marcos, USA
Santacruz Carlos, Mexico
Schalcher Hans-Rudolf, Switzerland
Schalcher Renata, Switzerland
Schenker Peter, Switzerland
Schenker Marivi, Switzerland
Schlaich Mike, Germany
Schmid Christian, Switzerland
Schubert Julian, Germany
Schuetz Elena, Germany
Schuster Ludwig, Germany
Schwan Bryony, USA
Schwartzman Karina, Mexico
Schwarz Edi, Switzerland
Scott Andrew, USA
Serageldin Mona, USA
Serapião Fernando, Brazil
Serrano Francisco, Mexico
Shukuya Masanori, Japan
Siress Cary, UK
Sobek Werner, Germany
Soiron Alicia, Switzerland
Soiron Rolf, Switzerland
Somaya Brinda, India
Soonets Silvia, Venezuela
Sorkin Michael, USA
St. Onge Josée, Canada
Stagno Bruno, Costa Rica
Sternberg Harald, Germany
Strassburger Viviana, Mexico
Streich Leonard, Germany

T
Taipale Kaarin, Finland
Tajima Takako, USA
Tardan Jenny, Mexico
Tolla Ada, Italy/USA
Topelson Sara, Mexico
Torres Diego, Chile
Treviño César, Mexico

U
Ugarte Alejandro, Costa Rica
Ugarte Jimena, Costa Rica
Ulsen Carina, Brazil

V
Vassal Jean-Philippe, France
Vazquez Elaine, Brazil
Vérut Caroline, Mexico
Viray Erwin, Singapore
Volkmann Christian, USA
Vonnegut Benedikt, Switzerland

W
Wallbaum Holger, Switzerland
Wasnuta Mark, USA/Canada
Weintraub Deborah, USA
Widder Lynnette, USA
Wijaya Prima, Indonesia
Four theoretical workshops

Lively and colorful

At the heart of the Holcim Forum were four workshops on critical aspects of “Re-inventing Construction”. The workshops took place during all three days and included excursions to exemplary buildings and projects in the region. These mobile workshops enriched the intellectual endeavor and related directly to the four workshop themes:

- **Yellow Workshop**: Reduce CO₂ – With technology to zero emissions
- **Blue Workshop**: Manage complexity – With integral solutions to an economy of means
- **Green Workshop**: Mine the city – With logistics to circular metabolisms
- **Orange Workshop**: Stimulate stakeholders – With incentives to implementation

Page 40
In each workshop the participants heard and discussed up to ten presentations by specialists from throughout the world. Top-notch speakers provided an impressive overview of the current state of technical knowledge, and elaborated their visions for radical change and significant progress. The participants took part in group discussions and collaborated to develop approaches for solving specific challenges.
The present climate change is being caused mainly by greenhouse gas emissions, for which humans are responsible. An estimated 35 percent of these emissions come from buildings. To halt climate change, ways must be found to rapidly reduce CO₂ production also in the construction industry. In the Yellow Workshop, facilitated by Sheila Kennedy, Hansjürg Leibundgut, Menghao Qin, Mike Schlaich, Masanori Shukuya, and Werner Sobek, the participants investigated questions such as how innovative construction materials and energy technologies can be pushed to achieve a breakthrough.

The workshop was full of vigorous discussions and marked by a democratic spirit. The participants not only proposed and discussed solu-
tions, they also voted on them. They concentrated on three stakeholder groups: building professionals, the public, and government. Building professionals need to apply more integral planning, and designers and contractors need to work closer together. Energy consumption remains too high because we lack suitable evaluation systems to reliably predict performance during the design phase. The public needs to be made aware of the problems; education must begin earlier, and access to relevant facts must be improved. The workshop participants agreed that governments have been showing little will to lead change. Common ground must be found for environmental and commercial interests, and political decisions must be made based on evidence.
The topic-related excursion, led by Bernardo Baranda and Salvador Herrera, gave the participants of the Yellow Mobile Workshop a better understanding of how CO₂ emissions can be reduced through public transportation systems. Professionals around the world have noticed Mexico City’s new Metrobús, with a network of 47 kilometers and 81 stops. The modern, low-emission buses travel in special traffic lanes reserved for public vehicles. The National Autonomous University of Mexico (UNAM) chose a similar system for its campus, which had been plagued with traffic jams and air pollution. The buses ease the problem of heavy, milling traffic. The PumaBús system was introduced in 2000, it has been connected to the metro network since 2008, and it is augmented by Bicipuma (bicycle) routes. A further section, considered by
some to be somewhat less promising, lead to Xochimilco, listed on UNESCO’s World Heritage register. This freshwater lake, which serves as an irrigation reservoir, has suffered one of the most radical transformations resulting from urbanization. Although there are efforts to save the area, they have been insufficient so far. New plans are envisioned for this site over the next few years.
Greater sustainability through complexity

Led by Diego Torres, Ludger Hovestadt, Ashok B. Lall, Mahadev Rahman, and Hans-Rudolf Schalcher, the participants of the Blue Workshop investigated complex buildings, their performance, and the interactions between individual components. The participants prefaced their summary report with two general statements: complexity is much too complex to reduce to a set of images or an animation, and a forum is far from an adequate format to deal with the issue comprehensively.

Nevertheless, the participants of this workshop, which was enlivened with inspiring presentations and a good dose of humor, presented four chief findings on the topic of complexity: To take advantage of complexity in building, one must consider the location, processes, and...
people. Complex systems are open and dynamic, consisting of highly interdependent elements. On the way to sustainable construction, complexity is not to be seen as a threat, but an opportunity. To achieve sustainability, complexity in building must increase, and stronger focus is needed on the interaction between buildings and nature or buildings and the city. Dealing with complexity requires passion and optimism; solutions are to be found in quality improvements and dematerialization.
Mexico's economy has changed markedly in the last 20 years. Large industrial zones like that at Azcapotzalco must be revitalized and reused. How can change be managed in complex urban areas? The Blue Mobile Workshop, led by Jorge Gamboa de Buen and Alejandro Hernández Gálvez, took the participants to this industrial zone, which is one of the most important development areas in the north of the city. Here, on an area of 55 hectares, a new ecological park promoting education and environmental awareness is envisioned. An urban renovation project in north Azcapotzalco, the Technoparque, has converted this part of the area into a business and commercial center. An extensive waterworks system here will collect rainwater, filter and clarify it, and recharge the groundwater. The excursion also led to the Nueva Granada Polanco Norte development area, to the newly revitalized Art Deco quarter Condesa-Escandón, and to Casa Luis Barragán.

Casa Luis Barragán, created by the Mexican star architect, recognized in 2004 by inclusion on UNESCO’s World Heritage list.
The city is a lode of materials and energy, resources waiting to be fully mined. The Green Workshop, facilitated by Marc Angélil, Cary Siress, Keller Easterling, John E. Fernández, Marco Sánchez, Mark Wasiuta, and Michael Sorkin, investigated ways of better using the resources of the city to reduce the ecological footprint of the construction industry. The participants opened their summary report with a comment on the title, which observes implicitly that cities indeed represent a resource and that this resource has not been fully exploited. The city should be understood as an organism that functions not with a linear metabolism based on consumption but with a continuous metabolism based on recycling.
The participants formulated five axioms to summarize their findings: one must strive toward cities without a linear metabolism, without pollution, without exploiting nature, without destruction, and without sprawling informal districts.
For once, edges were at the center: the Green Mobile Workshop, facilitated by Arturo Ortiz Struck and Rozana Montiel, took the participants to the fringes of the city.

The group visited Ciudad Jardín Bicentenario, a former landfill for 10 million tons of waste that is now being transformed into a new social, commercial, and recreational center which will provide over 5,000 jobs. Also on the itinerary were Tlatel Xochitenco, a development that includes schools and a landfill, and Chimalhuacán, a largely informal district that is being upgraded to give the inhabitants new prospects for a much higher quality of life.

The Green Mobile Workshop took the participants to the informal district of Chimalhuacán whose roots date to the 13th century.

Chimalhuacán is a district with urgent needs and great potential that is beginning to be developed.
The workshop participants were also introduced to Lago Nabor Carrillo, a lake which provides water treatment, flood control, and irrigation water for Mexico City.

Chimalhuacán is among the poorest informal districts in the outskirts of Mexico City.

A new commercial and recreational center is being built on an abandoned site in Ciudad Jardín Bicentenario.

The program included a visit to Lago Nabor Carrillo, a vital lake for Mexico City.
Breaking vicious cycles

How can sustainable construction methods become standard practice? By including all players involved in design and construction. But incentives are also needed. The Orange Workshop studied what the appropriate standards, regulations, and strategies might look like. The participants, led by Ray Cole, Chrisna du Plessis, Arab Hoballah, and Holger Wallbaum, determined that adequate instruments for sustainable construction are at hand already today, but that change is not yet occurring at the desired scale and rate. They agreed that players beyond the group of normally identified stakeholders must now be motivated; one must ask, for instance, which “silent stakeholders” would speak for the environment or for future generations. The participants drew the following conclusions from the case studies they handled: The challenge
is to break the vicious cycles, to cultivate understanding for each place, and to develop a feeling of pride and empowerment. The commitment of stakeholders depends on the values of the involved individuals. Opportunities to activate stakeholders always depend on the context; shared visions and responsibility and participation are required.
Jose Castillo and Enrique Martín-Moreno led the participants of the Orange Mobile Workshops to Faro de Oriente in Iztapalapa, one of the poorest districts of Mexico City. Here the Department of Culture operates a large building that provides an alternative solution to conventional cultural intervention and is a combination of an art school, a cultural space, and a public plaza. The participants also visited the City of Nezahualcóyotl (“Neza”), the largest informal settlement in the outskirts of the city with some 1.5 million inhabitants, the Ciudad Jardín Bicentenario development as well as the Tlatelolco Housing Project built by renowned Mexican architect Mario Pani Darqui.
This project exemplifies the difficulty of designing dense urban residential districts. It met with disenchantment soon after it was finished, due in part to the repetitive and abstract character of the buildings and to the overpowering scale of development as a residential environment.

The Faro de Oriente is a striking and very successful social project in an impoverished district.

The Tlatelolco Housing Project was another stop on the program of the Orange Mobile Workshop.

The workshop tour also took the group into the heart of the city of Mexico.
Encounters

A platform for discussions

Alicia Medina, Canada/Mexico; Samantha Leung, USA; Mona Serageldin, USA; Caroline Vérut, Mexico.
“I have had discussions at many conferences,” told a participant at the Holcim Forum, “but the talks were never as open as they are here. This shows me that the community dedicated to sustainable construction is becoming more tightly knit.”

Although the program of the Holcim Forum was rigorous, there was also enough valuable time for personal interaction. This is one of the most important aspects of the Forum because a long-term breakthrough for sustainable construction can be achieved only through close collaboration among professionals. Our picture gallery illustrates the variety of informal exchanges that took place.
Encounters

Claude Armstrong and Donna Cohen, USA.

Rolf Soiron, Switzerland; Abderrafih Lahbabi, Morocco.

Werner Sobek, Germany; Hansjürg Leibundgut, Switzerland.

Amory B. Lovins and Thom Mayne, USA.
Mike Schlaich, Germany; Masanori Shukuya, Japan; Bogdan Drăgănescu, Romania.

Cheryl Harmsworth, Canada; Deborah Weintraub, USA. In the background: Séverine Baudoin, Belgium; Vanderley John, Brazil.

Viviana Strassburger, Mexico; Yolanda Kakabadse, Ecuador; Sara Topelson de Grinberg, Mexico.

Fernando Serrano, Mexico; Edward Schwarz, Switzerland; Carolyn Aguilar Dubose, Mexico.

Benno Hossbach and Michael Dax, Germany.

Guillermo Ortiz Taboada and Carlos de Leo, Mexico.

Vanderley John, Brazil; Bruno Stagno, Costa Rica.

Mike Schlaich, Germany; Masanori Shukuya, Japan; Bogdan Drăgănescu, Romania.

Viviana Strassburger, Mexico; Yolanda Kakabadse, Ecuador; Sara Topelson de Grinberg, Mexico.

Fernando Serrano, Mexico; Edward Schwarz, Switzerland; Carolyn Aguilar Dubose, Mexico.

Cheryl Harmsworth, Canada; Deborah Weintraub, USA. In the background: Séverine Baudoin, Belgium; Vanderley John, Brazil.
Encounters

John Fernández, USA; Eduardo Cruz, Mexico; Aziza Chaouni, Morocco.

Ludwig Schuster, Germany; Christian Schmid, Switzerland.

César Ulises Treviño and Jenny Tardan, Mexico.

Martin Felsen, USA; Alejandro Lirusso, Eduardo Cruz and José Picciotto, Mexico.

Haley Heard, USA; Masanori Shukuya, Japan; Matthias Mast, Switzerland.

Cristina Ponce and Manuel Bustamante, Mexico.

Ray Cole and Daniel Pearl, Canada.
Ludger Hovestadt, Switzerland; Harald Sternberg, Germany; Cary Siress, UK.

Raúl de Villafranca, Mexico; Bill Reed, USA; José Picciotto, Mexico

Jean-Philippe Vassal, France; Denise Bratton, USA.

Giuseppe Lignano, USA/Italy; Sarah Dunn and Martin Felsen, USA.

Giuseppe Lignano, USA/Italy; Chrisna du Plessis, South Africa; Carolyn Aguilar, Mexico; Aziza Chaouni, Morocco.

Masanori Shukuya, Japan; Alicia Soiron, Switzerland; Prima Wijaya, Indonesia.

Viviana Strassburger, Mexico; Patricio Mardones, Chile.

Bruno Stagno, Costa Rica; Florencio Manteca, Spain; Hans-Rudolf Schalcher, Switzerland.

Elias Cattán, Mexico; Takako Tajima and Bill Reed, USA.
Concluding panel discussion

At the end of the Forum, a panel of renowned experts discussed the issues treated in the workshops and presentations – and drew some initial conclusions. The panel comprised Yolanda Kakabadse (Ecuador), Takako Tajima (USA), Aziza Chaouni (Morocco), Ashok Lall (India), Arab Hoballah (France), Enrique Norten (Mexico), and moderator Rolf Soiron (Switzerland).

“How can we bring the planet into a condition of sustainability, a condition which clearly does not exist today?” Rolf Soiron submitted this general problem to the assembly – and directed an explicit question to the panel: “In everything that we’ve heard these last three days, is there a common denominator, or consensus, or elements, which can serve as a basis for future development?”

Moderator Rolf Soiron (Switzerland) is Chairman of the Board of Directors of Holcim Ltd and Chairman of the Advisory Board of the Holcim Foundation.
Yolanda Kakabadse, representing social and environmental interests, pointed out the importance of choosing the right people for positions of responsibility: “One person at the top can make a tremendous change.” Additionally, it is vital to keep the context in view, “because not every solution works in every situation.” Takako Tajima agreed: “In construction, one must also consider deconstruction – and understand it as a part of the building lifecycle, not as an act of destruction.” She framed demolition in a broader context: “It can be a question of buildings, obstacles, or preconceived notions.”

“The concluding panel experts of the Holcim Forum (from left): Enrique Norten, Takako Tajima, Aziza Chaouni, Rolf Soiron, Yolanda Kakabadse, Arab Hoballah and Ashok B. Lall.

Yolanda Kakabadse (Ecuador) is President of WWF International, Senior Advisor of the Fundación Futuro Latinoamericano, and Member of the Advisory Board of the Holcim Foundation.
Ashok B. Lall referred to the presentation of Amory Lovins (page 8), who showed many innovations that are now receiving international support. “From Jeremy Rifkin (page 14) I am taking home cultural and social optimism founded on human empathy. Werner Sobek (page 26) discussed two important aspects of sustainability: the environment and energy.” Although many points were discussed, Lall felt something was lacking: “We have largely left aside the political, commercial, and socioeconomic aspects that could lead us to sustainability.” Nevertheless, the interplay of knowledge, awareness, determination, and motivation evidenced at the Forum was for Lall a clear sign that “nothing will happen without cooperation among all fields.”

“Will, motivation, awareness, knowledge – all seem to be interlinked.”

Ashok B. Lall (India) is Founder and Principal of Ashok B Lall Architects, based in New Delhi; he was a Member of the Asia Pacific and Global juries of the Holcim Awards competition 2005/06 and Head of the Asia Pacific jury for the Holcim Awards competition 2008.

Arab Hoballah expressed a critical view of the presentations, saying that good ideas and projects were presented, but the open question always remained: “And what now? How can we implement all this?” We know virtually everything we need to know, but “we cannot manage to act in one accord. We must bring the important people to one table and achieve agreement on real measures. We should not wait until we gain
more knowledge – we should finally take action.” Also, a sort of global benchmark system is needed which can serve as a basis for the individual solutions of each country.

“We know almost everything that we want to know. Now we need to act – but we mustn’t act individually.”

Aziza Chaouni (Morocco) is Co-Founder and Principal of Bureau EAST, with offices in Morocco, Canada, and the USA; together with Takako Tajima (page 69) she represented the team that won the Global Holcim Award Gold 2009. Aziza Chaouni agreed that many possibilities are available, but few solutions. She thinks that this has something to do with the term “sustainability,” which has not yet been adequately defined. This goes so far that young architects like Michel Rojkind (page 32) show a certain reluctance to use the term. “We know that we must translate sustainability into action, but we don’t yet know what this means for each country.”

“There has been a growing suspicion about the term ‘sustainability.’ We all know that we have to engage in it, but the term has been abused and is not well defined.”
What disturbed **Enrique Norten** the most was that the entire discussion of sustainability was limited to negative concepts. “Everything we discussed is based on reduction, zero, less material, reduction, and more reduction. After 20 years of hearing this talk, I am tired of it.” He misses the positive side, the sign that something additional must come – “Inventiveness. Because invention represents not reduction, but vision.” But instead of that, we continually repeat ourselves – even though the title of the conference is visionary. “But when it comes to drawing the final conclusions, I see no vision.”

“It’s always about reduction and reduction and reduction. And after hearing this for 20 years, I think we are totally tired of it.”

Ashok B. Lall disagreed, finding that inventions and positive concepts are definitely at hand. Nevertheless, the real challenge that remains is to decide how and where to apply these concepts. “One must, for example, adapt the visions to the fact that our increasing population requires increasingly more resources to meet its basic needs.” Innovation could also widen the gap between rich and poor. “But do we have time to wait for a consensus when problems are lurking everywhere?”

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**Enrique Norten** (Mexico) is an Alumnus of Universidad Iberoamericana, Principal and Founder of TEN Arquitectos, with offices in New York and Mexico City, and Member of the Advisory Board of the Holcim Foundation.
Takako Tajima, defended her view as entirely positive. Deconstruction is just as important as construction, because it creates room for the new: “demolition leads to building.” For Yolanda Kakabadse the question of responsibility is a topical issue. “We always talk about our responsibility for our grandchildren, but this mindset of thinking in terms of the next 50 years has led us in the completely wrong direction. We always find excuses that we need more knowledge or research – but what we really need is immediate decisions.”

“Deconstruction has to be seen not as something counterproductive, but as something productive and positive.”

Yolanda Kakabadse and Arab Hoballah agreed on the complex issue of consumption: you can’t lump together a rich American with a poor Nepalese. “But you can talk about sustainability with each of them, when you place the subject in the right context,” said Hoballah. Context is a critical aspect of every complex issue. That includes the building sector, and that’s why sustainable construction is a task not only of architects and engineers, but also of mayors and presidents. It also always depends on wanting to see the positive, again touching on the issue of a negative mindset. Enrique Norten picked up this thread and called for a redefinition of the words “beauty” and “aesthetics” in terms that apply for everyone. “That would change our view of the world and answer the question of what kind of world we want to live in – and how this world should look in the future!”
At the Holcim Forum students from seven colleges around the world presented convincing projects for sustainable construction – and enriched the event with usable ideas.

The participants at the Holcim Forum worked with great concentration. The breaks were generally short, but were also well used – for personal talks between professionals from around the world, and for the Student Poster Competition. 21 students presented their sustainable construction projects on large boards exhibited in an attractive gallery; the Forum participants were asked to assess the projects.

This competition was conducted by the Holcim Foundation and its seven partner universities: Swiss Federal Institute of Technology (ETH Zurich), Switzerland; Massachusetts Institute of Technology (MIT), Cambridge, USA; Tongji University (TJU), Shanghai, China; Ecole Supérieure d'Architecture de Casablanca (EAC), Morocco; Universidad
The tension was high just before Hans-Rudolf Schalcher, who moderated the entire Forum, announced the winners.

Iberoamericana (UIA), Mexico City, Mexico; Universidade de São Paulo (USP), Brazil; University of the Witwatersrand (Wits), Johannesburg, South Africa.

Some of these universities had conducted their own internal competitions to select their top students to be invited by the Holcim Foundation to attend the Forum. The “admission fee” was the student poster. The students, some of them working in teams, went to great lengths to complete their projects on time and in an attractive form – and the 270-person jury also faced a great challenge to select the best of the good work.

A welcome side effect of the competition was the interaction between students and professionals; the students took advantage of the opportunity to explain their projects to interested viewers, answer questions, and make new contacts – which in the future will strengthen the effort to achieve sustainable construction.
First prize in the competition went to Philippe Jorisich (right), Forrest Meggers (left), and Dario Pfammatter. The students from the Swiss Federal Institute of Technology (ETH Zurich), Switzerland, presented an architectural concept for dense development based on horizontal instead of vertical density. The project was elaborated for ABZ Cooperative of Zurich, Switzerland. The presentation board explains six cardinal points of Boba flat: The history of the building remains recognizable, no open areas are wasted, the pattern of space use optimizes the usable area, a lively sequence of micro and macro prevents tedious repetition, energy management is decentralized, and long-term thinking has sway over short-term benefits.
Tomb houses – a remedial approach to save Anfgou

Second prize went to Issam El Mousghi (right) from the Ecole Supérieure d’Architecture de Casablanca (EAC), Morocco, for the project “Tomb houses.” Anfgou is a remote region of Morocco that has no infrastructure; in 2006, twenty six children froze to death during a cold period there. By providing solar panels, better roofs, protected paths between the houses, and enclosed fireplaces, El Mousghi envisions making these houses, built by nomads from the south, weather resistant – with a long-term view to saving lives. – All student poster prizes were presented by Hans-Rudolf Schalcher, Head of the Technical Competence Center of the Holcim Foundation (left), and Rolf Soiron, Chairman of the Advisory Board of the Holcim Foundation (center).
Carina Ulsen from the Universidade de São Paulo (USP), Brazil, won third prize with her presentation of how sand can be recycled from construction waste and demolition rubble. She shows how massive problems can be solved by reclaiming the necessary sand from rubble on construction sites. This practice would not only reduce the large volume of waste produced in São Paulo – 500 to 1,000 kilos per person per year – it would reduce the transport of sand, which represents a high cost for the construction industry.
Channels for learning – a zero-energy campus for impoverished students in Siem Reap, Cambodia

A special prize went to Siobhan Rockcastle from the Massachusetts Institute of Technology (MIT), Cambridge, USA. She presented her project for a zero-energy campus in Cambodia. The campus is also conceived to give students with no money an opportunity for academic training. The most important energy-related issues in the region are rainwater distribution and the use of wind. Rockcastle shows how both of these natural resources can be optimally used. The campus is laid out on a north-south axis in response to winds, and the roofs are designed to collect rainwater.

Riparian urbanism – riparian drainage system as urban armature

A further special prize went to Haley Heard from the Massachusetts Institute of Technology (MIT), Cambridge, USA, for her presentation on urbanism and riparian land. Ninety percent of the world’s large cities are situated in riparian areas – locations that are strategically important but usually environmentally sensitive. Heard shows how the water could be used in such a way that natural habitats for flora and fauna would remain protected. At the same time, floods could be better controlled and epidemics prevented by maintaining existing natural systems and their mechanisms instead of replacing them with artificial systems.