



Aerial perspective - Khandamah night shot with the Holy Mosque in Makkah

Megaprojects in the Kingdom of Saudi Arabia - Innovationskraft by Nature

Lindemann Architects

Tobias Lindemann is a German Architect, Engineer and Entrepreneur. He is currently the CEO of White Sky Group, Managing Director of Lindemann Architects and invested in different ventures. Lindemann is best known for creating futuristic zero-energy houses with combined electromobility and award-winning megaprojects in the Kingdom of Saudi Arabia:

As architects we have to be masterminds of sustainable change in planning and construction. Our parametric design development and building information modeling (BIM) is only the first step, but a decisive one. The building industry needs disruptive technologies and innovation, I wrote in a Construction Week interview in 2012. „Making a mark“ was the headline of the article on German companies pla-

ying a major role in GCC projects. While the UAE became the largest buyer of German goods in the Arab world, Saudi Arabia leads in terms of the overall trade with Germany. Part of the article was our winning entry (1st prize) of a megaproject competition in Saudi Arabia with an estimated construction volume of € 22 billion and a construction period of 10-15 years at that time.

The Kingdom of Saudi Arabia offers vast opportunities in master planning, residential housing, infrastructure and transportation structures like airports or train stations. Technologies and materials will play a paramount role in implementing most sustainable urban strategies and concepts. It will be exiting to introduce disruptive design innovations to the KSA construction industry. Taking sustainability to the next level, the Lindemann Group keeps on innovating master plans, architecture and urban structures. Developing plus energy houses combined with electromobility will be one of these disruptive innovations and have a great impact on future residential housing.

Khandamah Mountain, Makkah

Lindemann Architects were invited to the Khandamah Mountain international planning competition in Saudi Arabia. But for this most challenging task of designing a new city extension for a population of almost 200.000 inhabitants in Saudi Arabia and due to the incredible size of the project, I asked two Berlin friends and architects to join this mega design adventure in the Kingdom of Saudi Arabia.

Since I launched White Sky Group - Engineering Ventures, we formed White Sky Group - Gewers Pudewill (WSG-GP). After six months of intense design research, modeling, design and urban development, we won this groundbreaking Makkah project. Our team managed to develop the best solution, virtually perfect for the most complex topography and project task we ever experienced, worldwide.

Winning a 91 hectares development in Makkah definitely has been a once in a lifetime project. Award-winning in sustainability, design and construction, the final master plan (2012-2014) integrates various building types including hotels, residential, malls, technical and medical infrastructure, mixed with parks and open spaces as well as spacious prayer areas. The design defines new innovation strategies and mobility, introducing a sensitive and balanced urban matrix. At the same time it represents almost six million square meters GFA in close proximity to The Grand Mosque in Makkah, the holiest site in Islam. The Khandamah Mountain project reflects the cultural heritage of Makkah and Saudi Arabia. It represents a unique and groundbreaking landmark development within the

Community Center, designed as a spiral form with exhibition spaces, auditorium, viewing platform and Cafes





Conference Center, seen from the corniche, offering spectacular views to Mina and Makkah, Park and Waterfalls

Makkah Vision 2030. Our design builds on a strong urban matrix, identity and branding core, following the clients vision.

The original design concept and winning scheme was judged by a renown jury: "The jury recognises the team's overall understanding of the site qualities and potentials as well as the cultural, symbolic, and urban values of the city of Makkah. The proposal has most successfully met the site challenges and the jury criteria. The urban morphology and scale have been quite sensitive to the heritage and context of the city in that they provide for a harmonious integration of the development within the existing city fabric.

The proposal skyline does not create an imposition on the city landscape and character. In particular the jury appreciates the proposal's site accessibility and connectivity with the holy sites and the rest of the city. The "carpet" concept provides an innovative feature that can enhance the human and social dimensions and needs of site users. Moreover, the parcel configuration provides an innovative and practical mechanism for project phasing and imple-

mentation. The jury believes that this proposal stands out for its excellent quality, innovative approach, and immense potentials to make the Khandamah development a unique and value added contribution to the city of Makkah, residents, and visitors."

Sustainability and innovation is at the core of Makkah Khandamah's design. The 91 hectares master plan includes infrastructure, outstanding landscape architecture, lighting design, innovative mobility solutions and maximum use of renewable energies. The mostly white façade's texture and the asymmetry work to reduce wind loads and protect from the intense climate and mechanical loads in Saudi-Arabia. The development represents a next generation Smart City. It offers most innovative architecture, mobility concepts and strategies, guarantees maximum Zamzam water protection and use of all available renewable energies. Additionally, a 100% electrification is intended to minimize further air pollution of Makkah and prevent CO2 emissions close to the Holy Mosque.

The iconic landmark development recognized the sanctity and symbolic identity of Makkah. The phasing

proves a sense of completion in each stage. We developed a unique urban fabric, which can be sustained over time with dramatic views towards the Masjid Al-Haram Mosque, Makkah and Mina. The innovative urban matrix shapes and enhances the visitor experience and responds to residents and pilgrims. It is viable throughout the year, changing mobility gears in peak times. The architecture and design provides creative and practical solutions of accessibility and of the transportation challenges within the site, and between the site and the Masjid Al-Haram Mosque.

Our thanks go to Jadwa Investment, Riyadh, the management team under the patronage of Governor Prince Faisal bin Salman bin Abdulaziz Al Saud, former Chairman of Jadwa, and our local consultants and engineers Al Fayadh in Riyadh for the ongoing trust and confidence they extended to our whole team.

L1 Houses, Riyadh

As BIM and parametric design became our everyday tools, new planning patents will allow us to identify and upgrade synergies between smart components during production and construction. This implies intelligent glazing and photovoltaics, automated appliances and computerized buildings. The goal is to build premium prefab houses, infrastructure and technology with the same

quality promise, German car makers deliver in premium cars today.

When Carl Benz invented the first automobile in 1886, it was the start of a long evolution process in design engineering to create the best product quality. A similar evolution process in architecture and building technology is evident. Lindemann Architects aim to create a fresh generation of sophisticated prefab houses emerging as plus energy architecture. The L1 house is ready to implement into a grid of solar power, wind power, heliostats, photovoltaics, and rain-water collection within a housing grid or compound. Late

L1 Prototyping KSA



Corniche perspective with open views and access to shopping malls and recreational areas



2012, Lindemann Architects started research and development for the L1 houses. Combined with brand environments and latest technologies of German suppliers, L1 houses integrate holistic planning with fully operating electromobility, gradually upgrading to offer a broader selection of future space frames and modules. The current L1 houses offer more than 350 square meter living and office space, spacious living areas, technology racks and garage modules for the needed number of cars for each household.

The concept integrates all kinds of future mobility, even gyro-copters. The L1 design is developed for the specific temperature and mechanical loads of the GCC climate. Hybrid solar modules generate both heat and electricity, conducting excess electricity to e-cars or feed public or compound networks. Using a future app, clients can customize their own L1 with brand environments and extras for technical devices, interiors as well as colors, glazing and lighting. An integrated panoramic roof as well as the pre-fabricated glazing surfaces and carbon facade modules will allow flexibility and individual customized design. L1 targets LEED Platinum and is build according to European standards.



Sky Tower and Makkah model



Tobias Lindemann,
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Conference Center, seen from the corniche, offering spectacular views to Mina and Makkah, Park and Waterfalls



King Abdulaziz Health Care Center, integrated in the surrounding green spaces

