ENERGY, TECHNOLOGY AND SOCIAL CONTEXT

**Joseph
Cory**

Summary

The paper will discuss GEOTECTURA projects that are based on multi-disciplinary research studies that explore sustainable architecture design using clean energy consumption methods while emphasizing social responsibility. Cory's work involves social, affordable, product-like and flexible housing reacting in real time to the future necessities and to the contemporary essentials. Joseph Cory's sustainable building prototypes won several international prizes: The techno-social **PV4All** paradigm that emerges in all of his designs received honorable mention in the 1st international Lisbon Ideas Challenge. Among his other theoretical designs one can find the **Ownless** unit for the modern homeless, the **WatAir** inverted pyramid for producing safe water (1st prize in the Drawing Water Challenge competition, London 2007), the **i-rise** project (Runner-up in the Next Generation competition, U.S.A. 2007, Project of the Year Award, Israel 2006, Finalist in the 4th international Bauhaus Award: Updating Modernism, Germany 2006 and 3rd prize in the Shinkenchiku Residential Design competition: Action for Sustainability, Japan 2005)**,** the **EcHotel** (2nd prize in the 'Free Architecture' competition, Israel 2004), and the **Absolute Green** for dense cities all of which are based on ecological, technological and most important – social aspects.

Keywords: Energy, technology, social context, sustainable, geotectura, water

1   Introduction

The former UN Secretary-General Kofi Annan said that "The last 25 years have seen the most dramatic reduction in extreme poverty the world has ever experienced. Yet dozens of countries have become poorer. More than a billion people still live on less than a dollar a day. Each year… 11 million children die before reaching their fifth birthday" [1]

Behind these numbers we must never forget that there are faces, names and sometimes entire communities. It is not just the problem of the third world or a remote country. It can be found even in the most advanced countries which failed to meet their obligations to end hunger and to eliminate homelessness in their own places as well as internationally.

In this paper I will argue that social indifference should come to its end and that the society must adopt global and social responsibility. The obligations under international law are to respect, to protect and to fulfil. The words are indeed inspiring but how can we realize these slogans and defend our economic, social and cultural rights throughout our design?

The Jewish architect Frederick Kiesler (1890-1965) spoke about the incapacity of society to provide and sustain a healthful and healthy shelter for all income levels. Being one of the pioneers who spoke about the environmental responsibilities of the architects in the 1930's he asked himself how come that we have excelled in erecting architectural monuments to gods of heaven and of earth, but we have failed to provide a simple, healthy home for man himself. Following his call I developed the PV4All planning paradigm that explores social use of photovoltaic technologies in a growing need for a sustainable environment. PV4All promotes global awareness and communal responsibility and sees beyond a single short term solutions. It is a complete design philosophy and not just a single product. This social and technological implementation concept once taken by many architects and designer should be for the people, increasing awareness and willingness around the globe.

2   Prototypes

The following projects are based on the collaboration with other designers from various fields such as science, architecture, art, landscape architecture and psychology under the platform of GEOTECTURA studio.

According to Amnesty – governments have often disregarded the rights of people elsewhere, supporting large-scale development projects which have resulted in widespread homelessness and violation of peoples' rights. We will start from small scale of providing aid to the individual and we will reach out for the urban scale and still maintain the social concern for that same individual. What is exactly the right to adequate housing?

> "The committee on Economic, Social and Cultural Rights has noted that more than one billion people worldwide lack adequate housing and that over 100 million are homeless… under the right to adequate housing, everyone should have a degree of security of tenure, protecting them from forced eviction, harassment, and other threats. Services available should include safe drinking water, sanitation and energy. Housing should be accessible to all, including the poor, and priority should be given to the most vulnerable." [2]

2.1   Small

Hannes Meyer, the Bauhaus director promoted the idea that the requirements of the people come before the requirements of luxury. It was Oskar Schlemmer, a famous teacher in the Bauhaus school, who wrote to his wife just before they moved into their modern house in Dessau:

> "I got quite a shock when I saw the house!
> I imagined how one day the homeless would line up outside while the gentlemen artists went sun bathing on the roofs of their villas."

Something went wrong from the first social-oriented attempts and concerns till the current state. Through the years the idealism of the Bauhaus gave its place to unsocial modernism.

Leaders of the modernism designed for the rich and neglected the poor. The international style gave short term solutions for the mass but paid no respect to the individual. This is why social responsibility should become again the first priority in sustainable planning and design.

In 1965 Hans Hollein proposed his Minimal Environment of living in a phone booth. He told me in an interview in Vienna (2006) that you could spend all your life within the booth and it can even become your coffin in due time. Hollein went a step further in 1969, when he proposed the inflatable mobile office that provided take-along-workspace to blow up.

Imagine we can live in just 1 meter cube house. It will be a good solution for the growing number of homeless but also a paradigm shift for respectable business people who will need a hotel combined with a car. The Ownless unit (**Fig. 1**) was an attempt to transform the homeless terminology into a hopeful term. On the same tone of the modernist sentence: "less is more" the Ownless unit is declaring that "less is home". And indeed – why not consume less if we can maintain the basic needs and freedom of mankind?

Each unit can have its own individuality through different graffiti of personal expression and protest or advertisement boards for earning extra money. It provides personal storage holder and recycle storage basket.

The true freedom is achieved via mobility of the Ownless unit. You can move from town to town by using the hitchhiking hook to a car. Photovoltaic cells placed on top of the unit are responsible for never-ending rechargeable batteries located inside the front wheels as well as the digital screen with wireless internet inside the sleeping and working box that keeps you updated.

Another important right is the right to water. According to Amnesty and other water aid Organizations over 1 billion people did not have access to a water supply capable of providing them with the safe drinking water necessary for a life with dignity. This lack of safe water is a cause of serious illnesses which kill over 2 million people every year (and again the vast majority of these numbers are children).

In a call to the challenging competition held by Arup and WaterAid to improve the access to safe water for billion people the award winning WatAir design (**Fig. 2**) simply produced water from the air. WatAir should bring Change and Hope with its simple and efficient approach! The water-web is a social design inspired by nature through its symbiotic relationship both with nature and rural dwellings and can be easily deployed within the eccentric environments as well as deployment on rooftops in dense cities. This design should be within reach for all people around the world. The WatAir has humanitarian aspects, education potential and sheltering capabilities. In order to make safe water an accessible reality worldwide we had to take into consideration minimal cost for the manufacturing of the product, easy and quick deployment in remote places, practical solution that will also work as environmental regenerator and as educational icon.

2.2   Medium

According to Amnesty gross economic and social unfairness is an enduring reality in countries of all political colours, and all levels of development. Even in the midst of plenty, many are still unable to access even minimum levels of food, water, education, health care and housing. In the following examples we will see unique housing and water solutions that are more feasible and practicable to the vast majority in Europe as well.
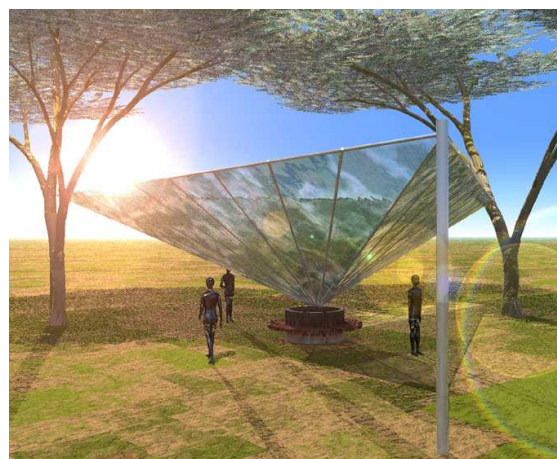
Fig. 1 Ownless by Joseph Cory & Jacob Eichbaum **Fig. 2** WatAir by Joseph Cory & Eyal Malka

The award winning i-rise project (**Fig. 3**) is a vertical, multi-story residential unit, with an integrated infrastructure for generating renewable energy, collecting rainwater and treat water and solid waste based on zero-environmental impact technologies. The i-rise is autonomous and self-sustainable in terms of energy: it generates its own renewable energy through integrated solar panels and a wind turbine. The Brain Unit functions as simple solar system, utilizing pyramidal panels that expand the active surface area of the unit, thus achieving maximum sun exposure.

The i-rise model would provide for basic, clean and eco-sustainable housing with enough flexibility for varying budgets and vernacular adaptations based on locally available construction techniques and materials.

Because of its multi-story layout, the i-rise model is an effective tool in addressing the density problem in third world cities: it provides these (poor) communities with more living surface, while 'taking up less of the city'. This addresses the socially unjust distribution of living surface where increasingly more people have to do with increasingly less surface per unit. With an average of 4 stories, plus an open garden and installation level, The i-rise will decrease the pressure on urban areas by a factor 4, and could be realized from within the communities themselves. The development, planning, construction and maintenance of the i-rises is an in-community business opportunity.

The lighthouse that was originally designed to watch out for ships in distress transforms itself in the LightWater project (**Fig. 4**) into a water producer. The idea is to build the tower near the sea. Salty water is being led into the base pool of the tower. The evaporation of sea water is being done by the solar irradiation through the heat that is trapped in the transparent polycarbonate tower walls. The salt is too heavy to evaporate and only potable water condensation occurs on the inner walls. The water runs down from the sides of the Lighthouse serving as ever changing waterfall facades. But beside the aesthetic appearance there is a functional value – the droplets fall into the side-line upper tunnels and – Walla – we can drink potable water out of sea water by following clear, simple, inexpensive, practical and sustainable guidelines.

Located high above the Lighthouse a sustainable cube contains energy source for the entire project by replacing the traditional lens/light bulb with photovoltaic solar cells that

provide energy, making this project energy independent. These solar panels on the head of the LightWater collect enough energy to preserve the inner heating process during the night as well and to double the productivity of the machine. The figure-ground relationship is trying not to harm the surrounding nature and it raises high above the ground, while the transparent layout will blend with the sky.

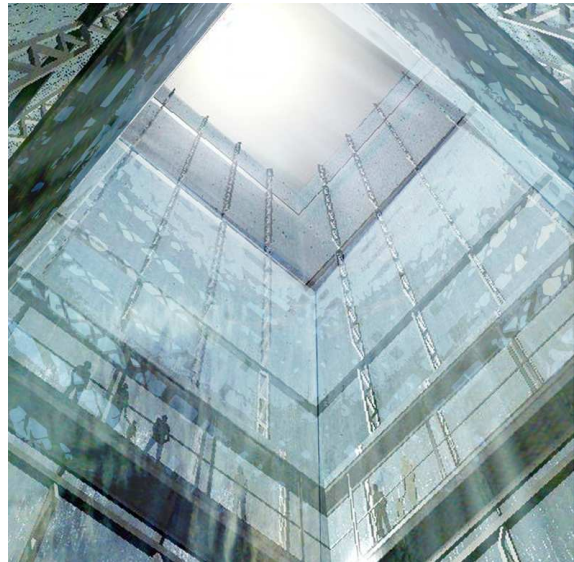**Fig. 3**   i-rise by Joseph Cory & Eyal Malka

Fig. 4   LightWater by Joseph Cory

2.3   Large

A bigger scale require us to use some rules like simple form and structure with exposed connections, modular structure grid system that allows expansion in any direction and so on. The building envelope should maximize the use of natural elements, sun and wind using movable screens, the right orientation and the minimal footprint principle.

When we think about an hotel we usually think about big and massive structures that are changing the view that was in the beginning the reason for building the hotel. Using a vertical program enables us to adjust the hotel (**Fig. 5**) to a sustainable era – it is not blocking the view and can be above street level near the see or below crest level. This ecological hotel with its minimal footprint cannot be seen from the approached path because it is sunk beneath the mountain's crest. The rest of the structure does not sit on the ground, but rather "hovers" above it with acupuncture steel columns while the surrounding nature gradually transforms into the hotel roof gardens.

This is what Kiesler wrote about our urban environment in the 1920's long before New York reached its current density:

"What are our houses but coffins towering up from the earth into the air? One story, two storys – a thousand storys. Walled up on two sides, on ten sides. Stone entombed – or wood, clay, concrete. Coffins with airholes.
Cemeteries have more air for the skeletons of their dead than our cities for the lungs of their living. Each grave has its lawn, its piece of meadow, a gravelled path to separate

it from its neighbors. Each grave an islet of green. Each his own master: each his own settlement.

And our cities? walls, walls, WALLS... We will have NO MORE WALLS, these armories for body and soul, this whole armorized civilization; with or without ornament. We want:

Transformation of the surrounding area of space into cities.

Liberation from the ground, abolition of the static axis.

No walls, no foundations.

A system of spans (tension) in free SPACE.

Creation of new kinds of living, and, through them, the demands which will remould society." [3]

We know by now that the real answer to the ever growing population is the skyscraper. Can we maintain in the skyscraper the same sustainable principles? Can a skyscraper be social oriented and still respect the individual? Give him the security he needs? Will it supply water and energy necessities? And will the poor be able to live in this self sufficient structure?

This urban scale structure (**Fig. 6**) contains gardens on each of the dwelling floating cubes in the sky while keeping a minimal footprint on the ground. The bioclimatic structure capsule approach enables space and function flexibility. Freedom & Individuality in design of the size and function of each unit are preserved within each cube giving panoramic viewpoints and optimal air flow. Together with the multi dimensional green environment and the terrace sky courts this versatile self sufficient capsules are reflecting a personal responsibility and commitment even in a higher ground. The tenant is always connected to the ground. This concept of two helicoids infrastructure is like a growing urban tree trying to improve the dwellers' life quality while living in the sky. The significant energy cube on top of the high-rise incorporate PV technology and water tank facilities making this building self sufficient. These mega cubes are weaving nature and communities back into the dense city.

Fig. 5 EcHotel by Joseph Cory & Michal Gurfil

Fig. 6 Absolute Green by Joseph Cory

2.4 XL

We should always look at the city in a new perspective. In a futuristic scenario that was looking for a free system of spans I imagined that one day an unexplained controlled Electro Magnetic force will be invented and will be used as a key element in the building industry. This for sure could have remodeled society as Kiesler hoped for. This controlled E.M. force will free humanity from the need to waste our planet resources by making the E.M. technology the ultimate sustainable method. E.M. Structures will be able to support each other simply by pure physical magnetism that can also direct electricity (**Fig. 7**). By using magnetic fields as a construction material there can be infinite vertical and horizontal expansions due to the final liberation from gravity. The concept intention was to make people think about the future but some people took it seriously and so I must add a warning - "Do not try this at Home!!"

Living off-ground led us to a less fictional idea. It is a well known fact that construction and operation of buildings belong among the biggest consumers of energy resources and environment pollution as well. So can we produce new technology with progressive materials and advanced construction solution?

Nonus is an energy solution that stands high above the surface with unlimited vertical growth in the shape of the solar balloons (**Fig. 8**). Nonus will develop and market a lighter-than-air helium-filled platform, containing embedded photovoltaic arrays (PVA) which extract electrical power from the incoming solar radiation. Nonous-1 balloon will be a low cost, easy to install and easy to maintain energy platform. Nonus will focus on making its patent-pending technology ready to market, and on business development with local partners around the globe.

Nonous envisions that the potential users of its technology span from energy-deprived villages in developing countries, through environmentally-aware individuals and organizations, to energy companies and governments that wish to utilize Nonus' breakthrough technology. To be able to approach all these markets, with their unique needs, cultural differences and priorities, Nonus' strategy is to partner with local renewable energy distributors that will lead the business in the specific target markets.

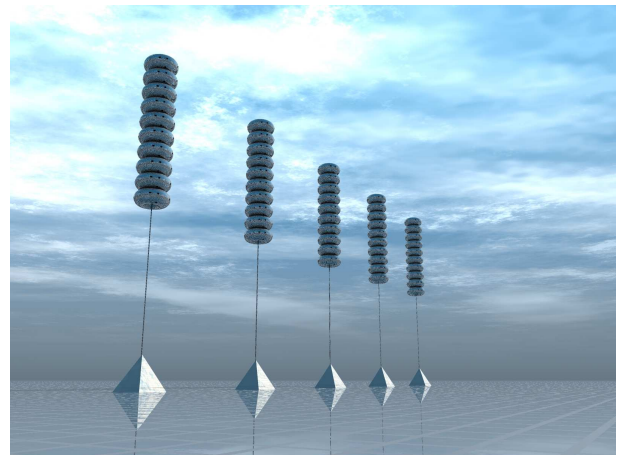**Fig. 7**   Futuristic electro-magnetic skyscrapers by Joseph Cory, Flavio Adriani & Genadi Agranovitch

Fig. 8   Nonus by Joseph Cory, Pini Gurfil & Moshe Selfin

3   Conclusions

As the social gaps are expanding the result is overall feelings of helplessness or scepticism. Instead of just blaming the governments and the big organizations we should bear in mind that the responsibility for social rights should be also with individuals, groups and enterprises. In order to engage the technology and the clean energy in a massive use we should appeal to the majority of the people and not just to the industries and high-end offices. It will be the social way to do it, and thanks to the massive numbers of those potential new users it will be the profitable way to do it as well!

GEOTECTURA set few examples of renewable energy sources for the poor, viable living conditions that reduce existing social gaps, clean potable water solutions and clean energy patents all of which are using simple principles and low tec systems.

Sustainable society development should become the major challenge for the international community as well as for the politicians and designers. It is time for new social strategies; it is time to think outside of the box in order to protect our one and only sphere!

References

[1]   *Human Rights for Human Dignity*. Amnesty International Publications, London 2005, p.1.

[2]   *Human Rights for Human Dignity*. Amnesty International Publications, London 2005, p.19.

[3]   KIESLER, FREDERICK. *Contemporary Art Applied to the Store and its Display*, New York: Brentano's Publishers, 1930, p.48

Joseph Cory, Ph.D.

⊠   17 Kiryat Seffer
    Haifa 34676, Israel
☎   +972 544 662 084
▤   +972 508 971 858
☺   geotectura@gmail.com
URL   www.geotectura.com