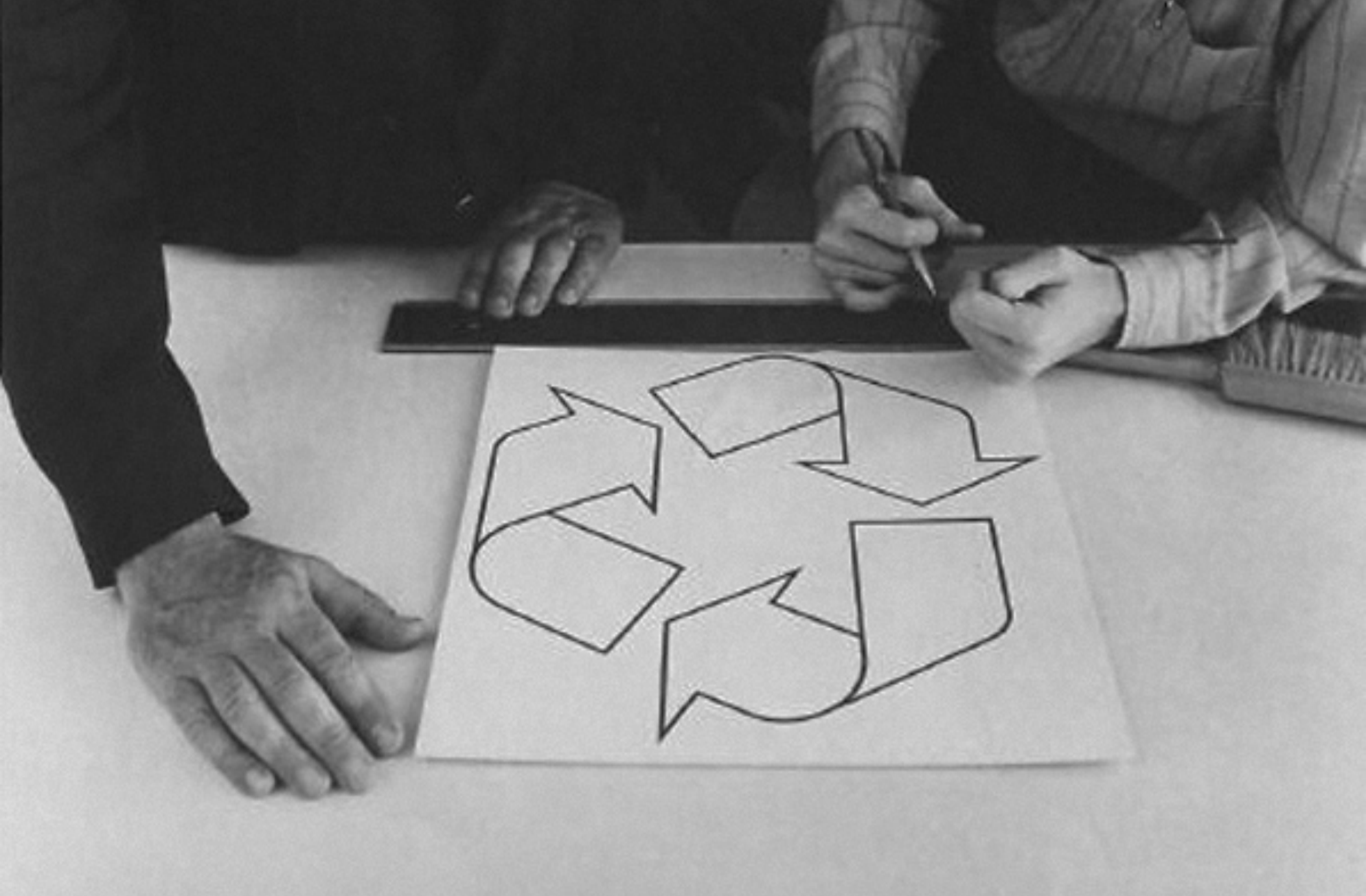


stba Contemporary City

REUSE



Morphology

- I urban and regional spatial structure
 - Pick-up points (routes)
 - Gathering places
 - Treatment, handling, transshipment

Science: Waste

From linear to cyclical flows: reduce, reuse, recycle

Economy: Export

Organized crime
Hidden costs (externalities)
Ecological rucksack

Waste habits “supported” by municipal “waste management services”

Resources at the wrong place

Life Cycle Analysis (LCA)

Recycle: Urban mining

Maintain stock levels
upcycle

Design: Upcycle

100 playgrounds

Plus Study

Büchnerstrasse

Save the Palm

A van Eyck

Druot, Lacaton + Vassal

S Foster

SMAQ

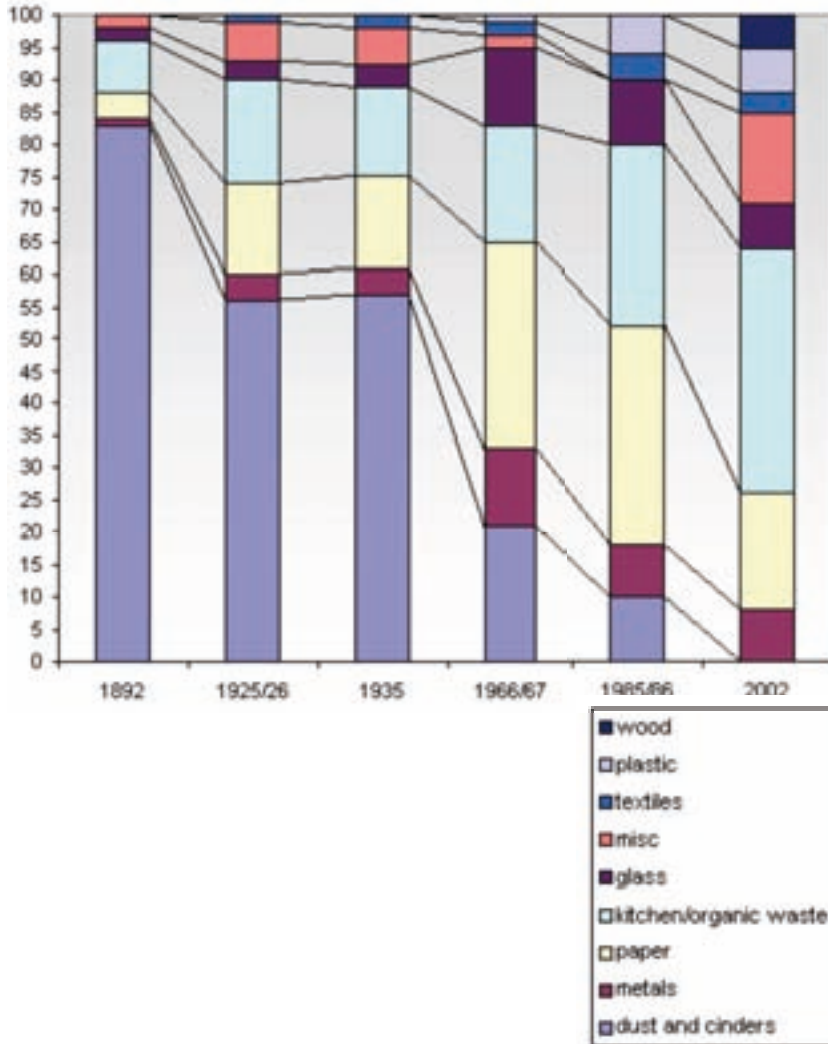
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Contemporary City

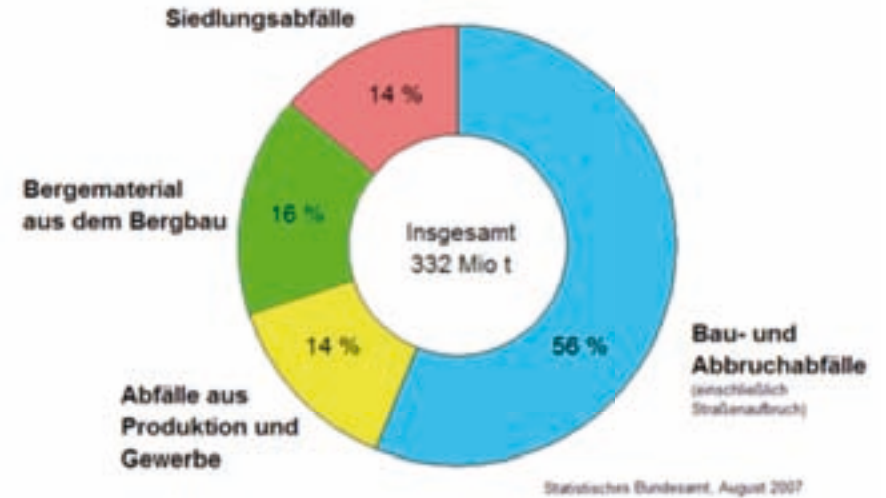
REUSE

Science: Waste

Waste – composition of domestic and national waste



Zusammensetzung des Abfallaufkommens im Jahr 2005
in %



Waste - amount correlates with GDP

„Economy: These Below-the-Radar Indicators May Signal Growth“ Bloomberg Business Week

(Die Abfallmenge wächst Jahr für Jahr, gegenüber 1984 um 40 Prozent, was ziemlich genau dem Wirtschaftswachstum entspricht. (Schweiz))

Waste on Freight Cars Gains Most Since '94 Confirming Rebound

By Michael McDonough and Bob Willis. Designed by David Yonokky. June 9, 2010
Click or move mouse over green areas for interactive content.

If garbage is any indication, the U.S. economy is strengthening. Shipments by train of waste and scrap, which are rising at the fastest pace in at least 16 years, have a higher correlation with economic growth than coal or copper, according to data compiled by Bloomberg News.

The number of freight cars carrying waste reached

79,044

in April and May, according to the Association of American Railroads (AAR).

This marks a

45%

increase from the same period last year. Waste freight hasn't grown as fast for any quarter since at least 1994.

From early 2001 through the first quarter of this year, the growth rate of carloads of waste has shown a statistical correlation of 82.4 percent with the year-on-year change in gross domestic product, according to Bloomberg calculations.

That is the strongest correlation among 21 categories sent by rail and tracked by the AAR.

Overlap size represents amount of correlation. Click an item for historical data.

“It's a very strong piece of corroborating evidence; it's sort of like measuring horse power by looking at the smoke coming out of the tail pipe. It's consistent with our broader view that economic growth is accelerating.”

Carl Riccardina, senior economist at Deutsche Bank Securities

The world's largest economy grew at a 3.3 percent annual pace in the second quarter, according to the median forecast of 63



Waste – quantity in relation to a city

RAPID RE(F)USE

NEW YORK CITY IS DISPOSING OF 36,200 TONS OF WASTE PER DAY



NEW YORK

ONE DAY TOWER: 24 HOURS OF COMPACTED WASTE



Waste - resources at the wrong place



FOUND ON REDONDO BEACH. AUGUST 21, 2005.

WWW.SURFRIDER.ORG



Waste - resources at the wrong place

The Great Pacific Garbage Patch

Is an area of marine debris, lying approximately 135° to 155° West and 35° to 42° North. Although it shifts every year and exact position is hard to tell, it lies within North Pacific Gyre and does not go anywhere, as it is confined by its currents.

The area

The Patch is around 2200 kilometers long and 800 kilometers wide



Plastic Soup

Consists of both larger and disintegrated plastic objects and particles, both on the surface, in the water column below it and on the bottom.



UN Environment Programme estimated recently that each square mile of ocean water contains 4,000 pieces of floating garbage.

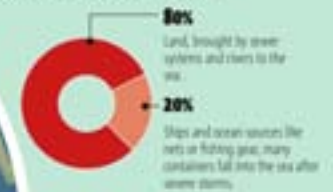
Problems created by plastic:

- It fouls beaches worldwide and scares tourists away
- Plastic entangles marine animals and drowns them, strangles them and makes them inedible.
- Plastic litter washed ashore destroys habitats of coastal species.
- Plastic litter gets inside ships propellers and keels, making ship maintenance more expensive.
- Plastic does not biodegrade, plastic things make an ideal vessel and enable invasive species to move to further regions.

How does it form?

Currents in the Pacific Ocean create a circular effect that pulls debris from North America, Asia and the Hawaiian Islands, then it pushes it into a floating pile of 300 million tons of trash.

Where does it all come from?



Interesting facts

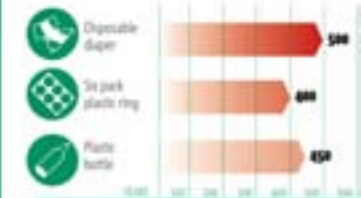
Less than 5% of plastic is recycled in the Central North Pacific Gyre, small pieces of plastic outweighed surface zooplankton by a factor of 6 to 7 in 2010. But the ratio in 2020 may already be 60 to 1.



Photodegradation

Plastic never biodegrades, it doesn't break down into natural substances. But it goes through a photodegradation process, splits into ever smaller and smaller parts, which are still plastic.

How long does it take to photodegrade plastic:



Economies of waste – exports



Pieter Hugo 40. Untitled, Agbogbloshie Market, Accra, Ghana 2010

Economies of waste - organized crime and control


“Control the flow of garbage and you have an entire sprawling metropolis by the jugular”

Words of a new York Mafia Boss in the 1950ties



Soylent Green, 1973, Richard Fleischer - Waste company rules the city

Waste - capitalism' dirty secret



“Modern economics is founded on waste, waste constitutes the suppressed other of capitalism, the dirty secret kept hidden under the mantra of “out of sight, out of mind “, though subsidized by externalized social and environmental costs”

(Going around in cycles, M. Angelil 2009)

Adrian Kondratowicz, TRASH: anycoloryoulike

A linear concept of material - from the mine to landfill

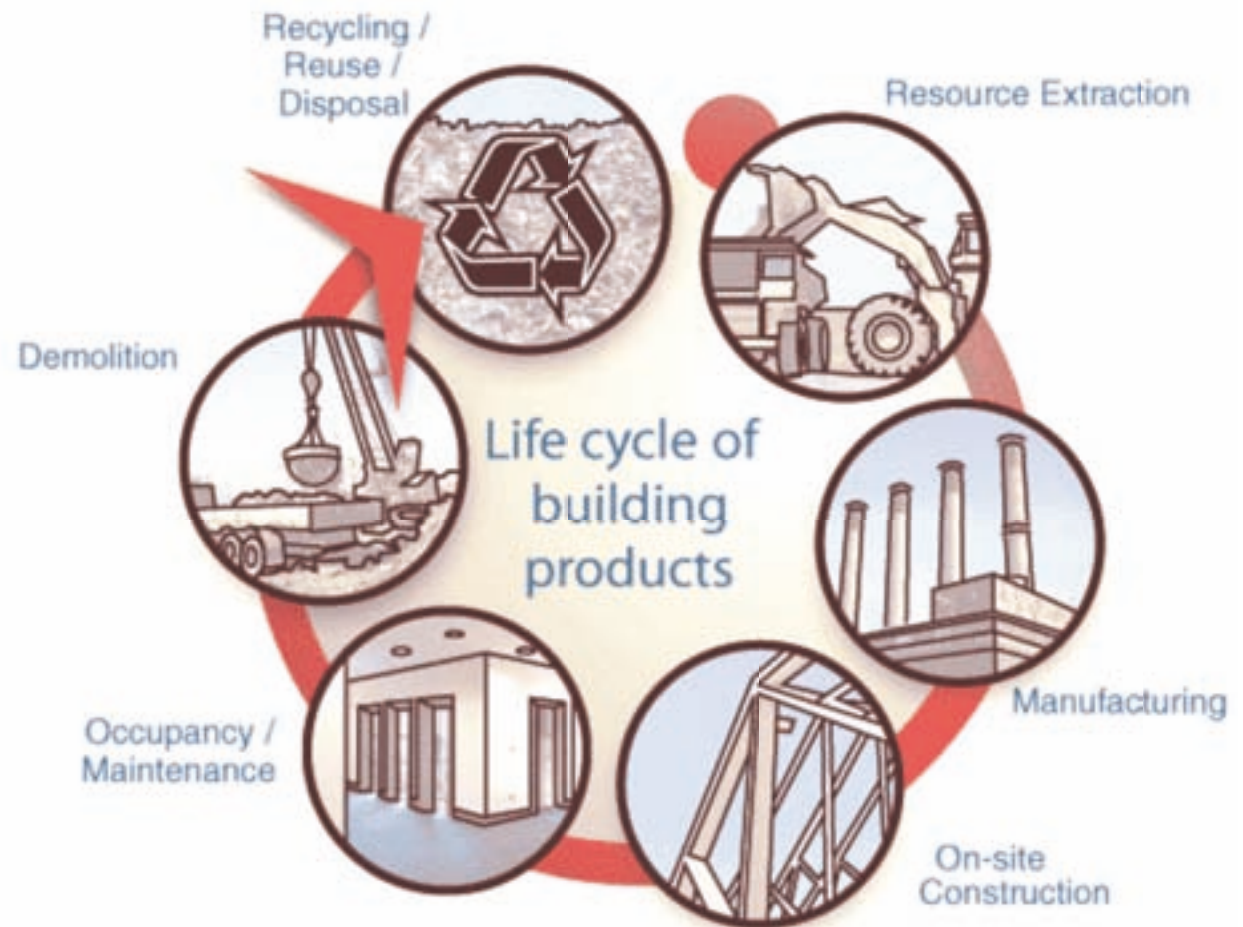


1000 hectares of land: Bingham Canyon Mine, UT - Manhattan, NY- Fresh Kills Landfill, NY

Extraction -> Usage (production -> distribution -> consumption) -> Disposal

Hidden costs –

Valuating material through Life Cycle Assessment (LCA)



Life Cycle Assessment (LCA)

Life cycle analysis examines the full range of environmental impacts over all the phases of a building's useful life instead of focusing on any particular stage. LCA helps to avoid shifting environmental problems from one place to another.

- resource extraction
- manufacturing
- transport and construction
- service and use
- post-use disposal

Life cycle analysis thus measures **ecological rucksack, embodied energy, externalities** plus the value of a product's performance:

- **operating energy** (if an aluminum window (high in embodied energy and externalities) is used for perfect insulation (low in service) it may well contribute to a positive LCA)
- **durability** (of materials, construction and adaptability - an inflexible building which is not adaptive to evolving use could face demolition even though all of its components are durable and performing adequately)

Externalities

The environmental impacts caused by an economic activity. Benefits or costs resulting as an unintended by-product of an economic activity that accrue to someone other than the parties involved in the activity or economic transaction.

Examples of externalities include:

- **Air pollutants - e.g. acid rain, ozone layer change**
- **Greenhouse gases – CO₂**
- **Water use and water quality – Eutrophication**
- **Reduction in biodiversity**
- **Land use values affected by waste disposal or environmental degradation.**

Externalities are typically not paid by the producer or polluter, but by individuals paying municipal tax to install landfills, next generations having to deal with long lasting poisons.

Ecological rucksack

The material input of a product minus the weight of the product itself. The material input is defined as the life cycle wide total quantity (in kg) of natural material moved (physically displaced) by humans in order to generate a good. (definition source: EEA. 1999. Making sustainability accountable, concept: Friedrich Schmidt-Bleek)

1 kg steel: 8 kg of rock and fossil

1 kg aluminum: 37 kg

1 kg copper: 348 kg

Embodied energy

is defined as the **energy consumed** by all of the processes associated with the production of a building, from the acquisition of natural resources to product delivery. This includes the **mining** and **manufacturing** of materials and equipment, the **transport** of the materials and to **maintain**, repair, restore, refurbish or replace materials, components or systems during the life of the building.

Embodied energy portion may be as high as 20 times the annual operational energy of an office building (Tucker et al., 1993)

Embodied energy can be the equivalent of as much as 20 years of operational energy over a house's 100 year lifespan.

Embodied energy



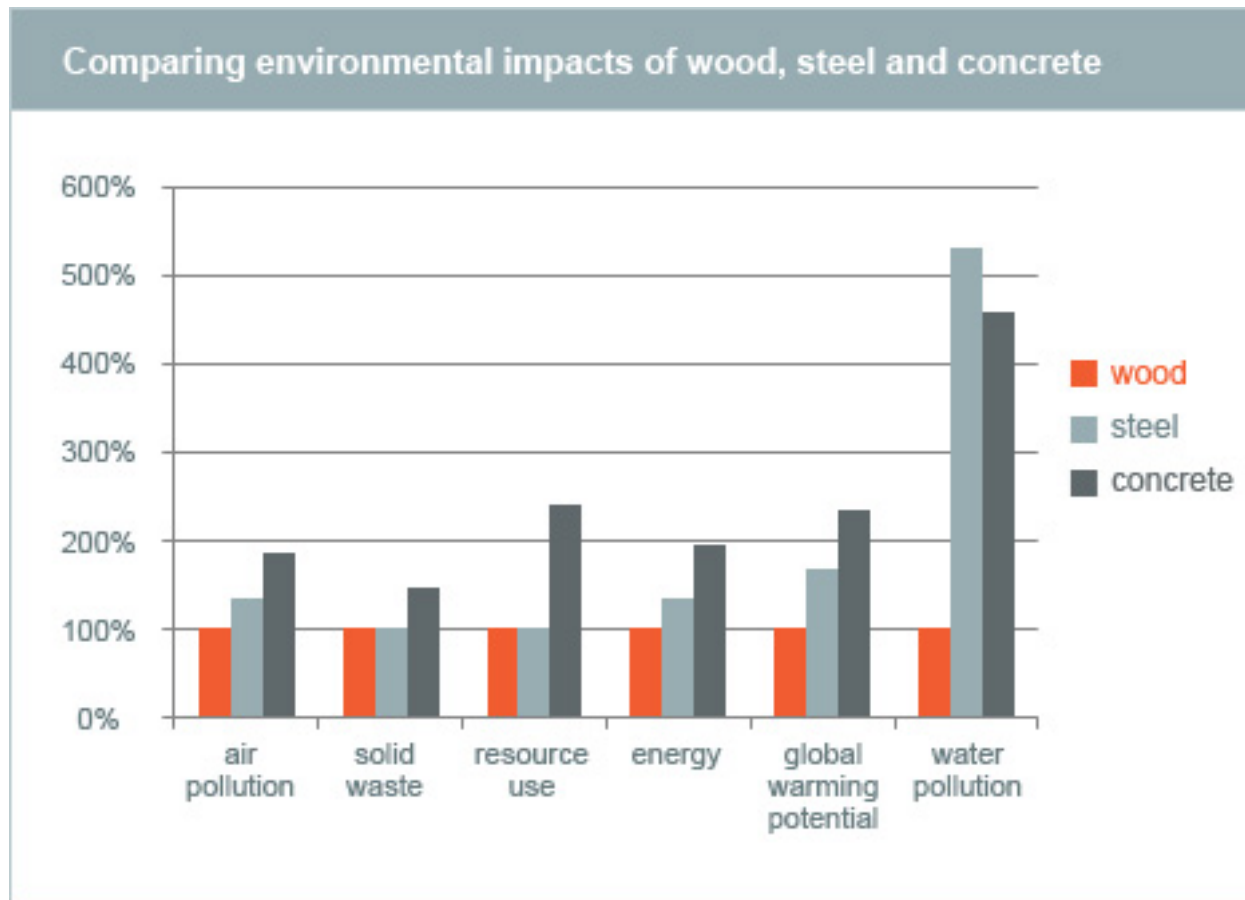
lightweight wooden construction wins:
project 8+, Schluder Architecture; Esmarchstrasse Berlin, Kaden Klingbeil



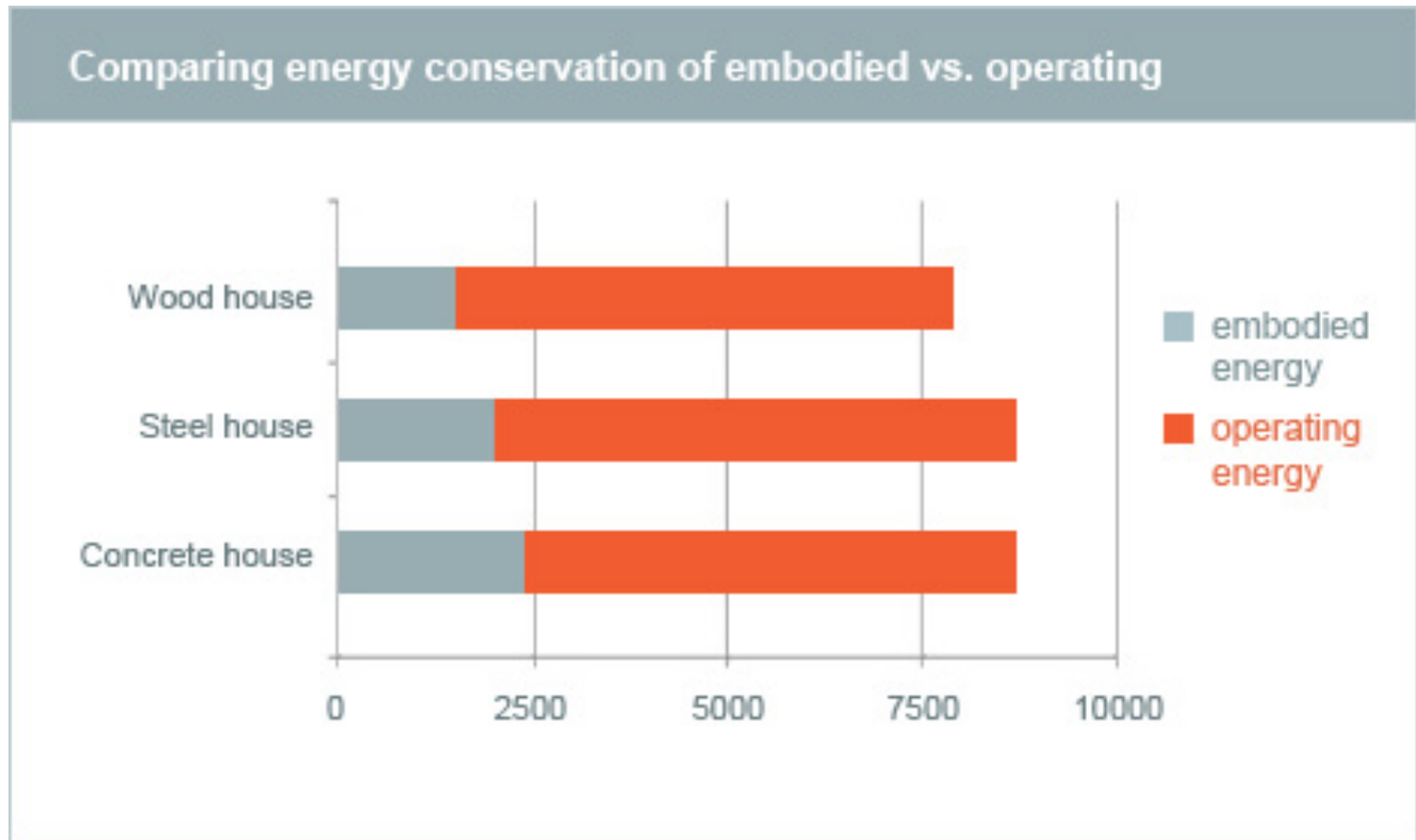
Embodied energy



Embodied energy



Embodied energy



Reduce - Reuse - Recycle



Reduce - Reuse - Recycle

European waste hierarchy 2006/2008

Kreislaufwirtschafts- und Abfallgesetz § 4 der BRD

Act for Promoting Closed Substance Cycle Waste Management and Ensuring Environmentally Compatible Waste Disposal, 1994

1.Reduce: use less

Reduction of materials with environmental hazard e.g. FCKW, and common sense ideas like turning off the lights, rain barrels, shorter showers, low-flow toilets, carpooling, light weight building

2.Reuse: keep the shape

Multiple use, such as second hand, resell, change, give, repair

3.Recycle: become a secondary raw material

- Material recycling: physical: metals and plastics; chemical: glass and paper - down-cycling
- Energetic recovering: methane collection, gasification and digestion

4.Dispose:

- Incinerate - high temperatures consume material efficiently while emissions are controlled
- Devastate - litter, burn barrels, and dumping discards onto land or into water

Recycle I - Urban mining



Thank you for littering, since 2001, Justin Gignag, sells at 50\$ each

Reuse I - Urban mining

Cities serve as material reservoirs

Most of globally available copper is now located in cities

Up to 30 times as much gold can be found in cell phone circuitry as can be found in the gold ore processed in gold mines

Building sector absorbs up to 50% of all material resources globally used
The built environment is the biggest material flow accumulation and economical asset of the industrialized nations.

In Germany the value of all buildings is 9,2 Bill. Euro; (monetary assets: 4,5 Bill.) <http://blm.ieb.kit.edu/index.php>

Reuse II – maintain stock levels



Shedboatshed, 2005, Simon Startling

Reuse II – maintain stock levels

For non-renewables (immobile material) the 'extraction–use–waste' process should be replaced with systems that maintain stock levels and constantly reuse that stock

Design to repair (easy and long life)

Design to reuse (neutral or adaptable spaces)

Design to recycle (disassemble and demount)

Reuse III - upcycling



Freitag bags;



Upcycling:
Köbberling Kaltwasser, Car to bicycle, Los Angeles

Reuse III - upcycling

Upcycling vs downcycling

W. McDonough, M. Braungart,
Cradle to Cradle: Remaking the Way We Make Things

Downcycling: Loss of material value in the process of recycling; (White writing paper to cardboard.)

Upcycling: Conversion of a material into something of similar or greater value, in its second life. (Aluminum and glass can be upcycled into the same quality)

Stop recycling, start repairing – become a bricoleur

Platform21's Repair Manifesto opposes throwaway culture and celebrates repair as the new recycling.

stba

Contemporary City

REUSE

Design: Upcycling

Reuse before it becomes waste

Design - Upcycling

I Retrofitting industrialized cities (Stadtumbau)

a. Revitalisation of inner cities (1700- 1890)

100 Playgrounds Amsterdam, Aldo Van Eyck - *capture unused space*

Birg mich, Cilli!, Viechtach, Peter Haimerl Architektur

Urban punc, Leisnig, Caroline O'Donnell - *add infrastructure*

b. Conversion of industrial sites (1880- 1950)

Stadtregal, Ulm, Rapp Architekten- *capture unused space*

c. Improvement of after war mass housing (50-70ties)

PLUS Study, Tringnac, Lacaton&Vasalle - *reground*

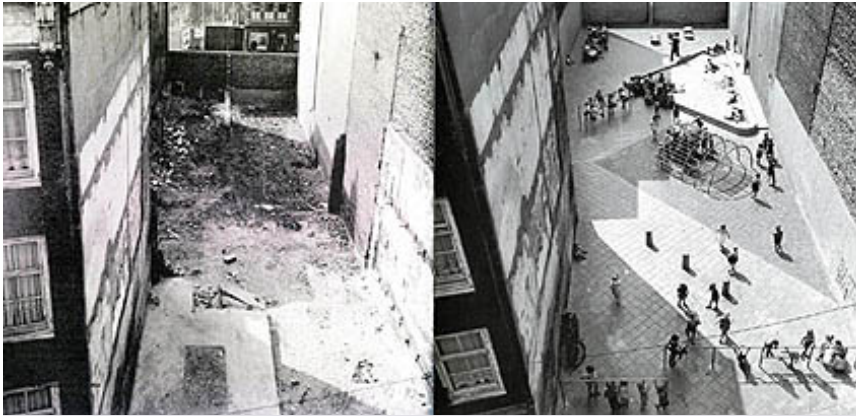
Büchnerstrasse 26-40, Leinefelde, Stefan Forster - *individualize*

II Retrofitting global developments (1980-2010)

De-colonizing, Israel-Palestina, DAAR residency, Salottobuono - *reconnotate*

Save the Palm, Dubai, SMAQ - *environmentalize*

Hundred Playgrounds Amsterdam, 1947, Aldo van Eyck



Plus Study, 2009, F. Druot, A. Lacaton, J.-P. Vassal



Plus Study, 2009, F. Druot, A. Lacaton, J.-P. Vassal



Plan ensemble avant transformation
X Démolitions prévues

Plus Study, 2009, F. Druot, A. Lacaton, J.-P. Vassal



Plan ensemble après transformation

0 5 20 50

Plus Study, 2009, F. Druot, A. Lacaton, J.-P. Vassal



Plus Study, 2009, F. Druot, A. Lacaton, J.-P. Vassal



Plus Study, 2009, F. Druot, A. Lacaton, J.-P. Vassal



T4 existant: 62m²

Desserte ascenseur existant
1 palier sur 3



Ajout de balcon
en béton préfabriqué
sur corbeaux métallique

Ajout de plancher semi-indépendant
en bac acier collaborant structure poteaux poutres
métalliques



Extension,
Terrasse,
Transparence.

Appartement 144m²
Séjour 51m²

Desserte ascenseur
sous niveaux,
Terrasse devant le logement

Plus Study, 2009, F. Druot, A. Lacaton, J.-P. Vassal



14^e planta - Antes de la transformación
14^{ème} étage - Avant transformation
14th floor - Before conversion



12^e planta norte - Jardín de invierno
12^{ème} étage nord - Jardin d'hiver
12th floor, north - Winter garden

Plus Study, 2009, F. Druot, A. Lacaton, J.-P. Vassal



17^e planta - Estar
17^{ème} étage - Séjour
17th floor - Living room



15^e planta sur - Doble estar
15^{ème} étage sud - Double séjour
15th floor, south - Double living room

Büchnerstrasse 26-40, Leinefelde, 1999-2008 Stefan Foster



Büchnerstrasse 26-40, Leinefelde, 1999-2008 Stefan Foster



Büchnerstrasse 26-40, Leinefelde, 1999-2008 Stefan Foster



Büchnerstrasse 26-40, Leinefelde, 1999-2008 Stefan Foster



Büchnerstrasse 26-40, Leinefelde, 1999-2008 Stefan Foster



Save the Palm, 2009, SMAQ







introduction

The Charter of Dubai is a manifesto of urban readjustment.

The Charter has been drafted at a moment in time when the global real estate market has ground to a halt. Locking around, we find ourselves with the remains of an investment practice that focuses on built premium spaces: malls, business parks, gated communities, resorts, resorts.

This document is based on the thesis that the luxury refuges of today will be inevitably reclaimed. A flicker is home in time, the refuge will be integrated into the larger context of tomorrow's open city and released into the dynamics of the environment.

Why call these premium spaces refuges? From a macro-spatial perspective, it is evident that these spaces form enclaves which withdraw from the wider city, or withdraw from society altogether. Across the world, these refuges have been exhibiting the tendency towards the development of a fragmented and socially stratified urbanity, which was pertinently described as splintering urbanism by Stephen Graham and Simon Marvin¹.

Taking up their argument, the self-contained resort is a subterfuge – a deception of independence – because these refuges extend their infrastructure and influence across borders and boundaries undetected. In turn, they squander resources at the

expense and exclusion of others. It is also a microcosm related to this topic that cities are separate from nature and do not need to be concerned in the study of ecosystems.

Any process to transform the refuge will thus necessarily engage boundaries via: multiplication, penetration, buffering, and articulating. By manipulating the perimeter and parameters of the refuge, new forms of interdependencies will proliferate. This act of border manipulation also provides gaps, openings, or potentials to release infrastructural networks.

The task at hand, now, how to turn the refuge from a traditional borough (a fortified town) into a borough, a quarter that is a functional and thorough part of the urban landscape?



Scale: 1:100,000. Dubai, United Arab Emirates. © 2011. Adapted from the Charter of New York City.



The Palm Jumeirah¹, also called the Palm Dubai, is not only the most spectacular of upscale refuges but it is also the paradigm: the ultimate diagram in terms of figure, internal organisation and external relations. This is why it serves as both a case study of critique and a test for transformation. Several measures of transformation are explored on the Palm while synchronically leveraged as general principles applicable to any upscale refuge.

The methodology is based on the notion that the luxury refuge built during the last real estate boom present a massive societal investment in terms of capital, expertise and labour. They have

been built to speculate on a heated real estate market; not as necessarily not to live in. On the Palm, so-called virtual elites have been bought and re-sold ten times before the first stone was laid. Prices tripled and when they suddenly fell, people with no actual interest in using the homes called themselves owners. In the aftermath, what remains of these dysfunctional specities is the half-bred infrastructure, namely the network, roads, cabins, tubes, and building stock.

The infrastructural skeleton, stripped bare from the hollowed-out core of an economy of attention and speculation, provides the substance that should be worked with. By addressing the structural logics of the refuge, the points of critique become stepping stones of intervention and moreover provide opportunity for radical interventions with major effects.

Each following chapter structures a scenario, or an idea for intervention; they are vignettes for further study. In particular, they introduce an aim and value, provide a critique and opportunity, and finally outline measurements of transformation and the subsequent benefits.

¹ Developer: Nakheel, Dubai
 Concept Designer: Nelson\Akkoy (Sheikh Pasad) (NYC)
 Operator: Emaar
 Construction start (2001), inauguration: 2008
 Construction cost: \$ 1.500.000.000 (approx.)
 Construction cost: \$ 1.100.000.000 (land)

Area: 3400 ha
 Location: 17 km
 Population: 35.000 people (incl. hotels and hotel guests)
 Program: 20 hotels (planned), 1000 villas and 2000 apartments (planned)



1

re:form

From spectacular image to urban figure

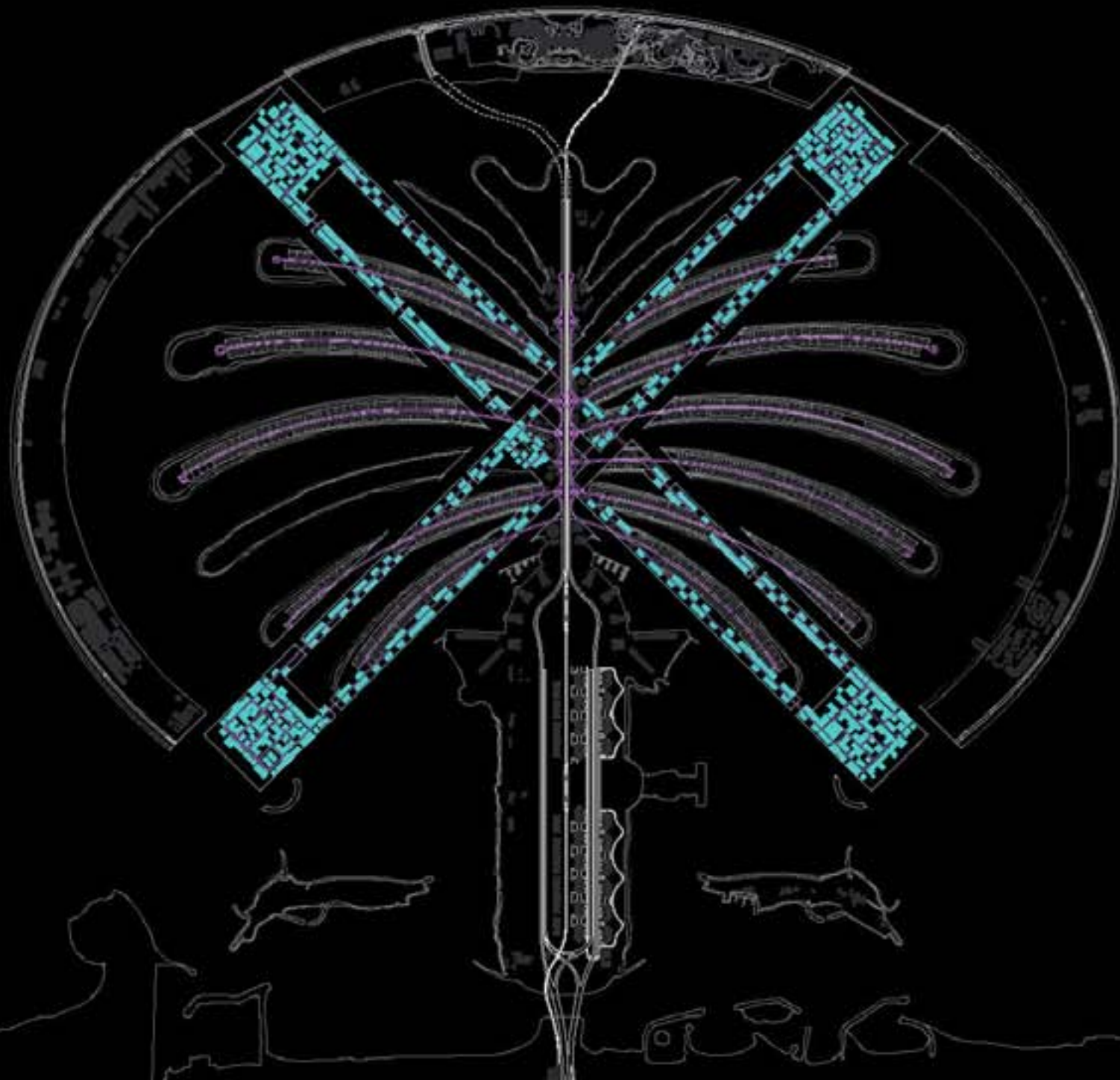
For the adopted city, form matters primarily as a generator of urban complexity and then only secondly as a marketing and communication tool.

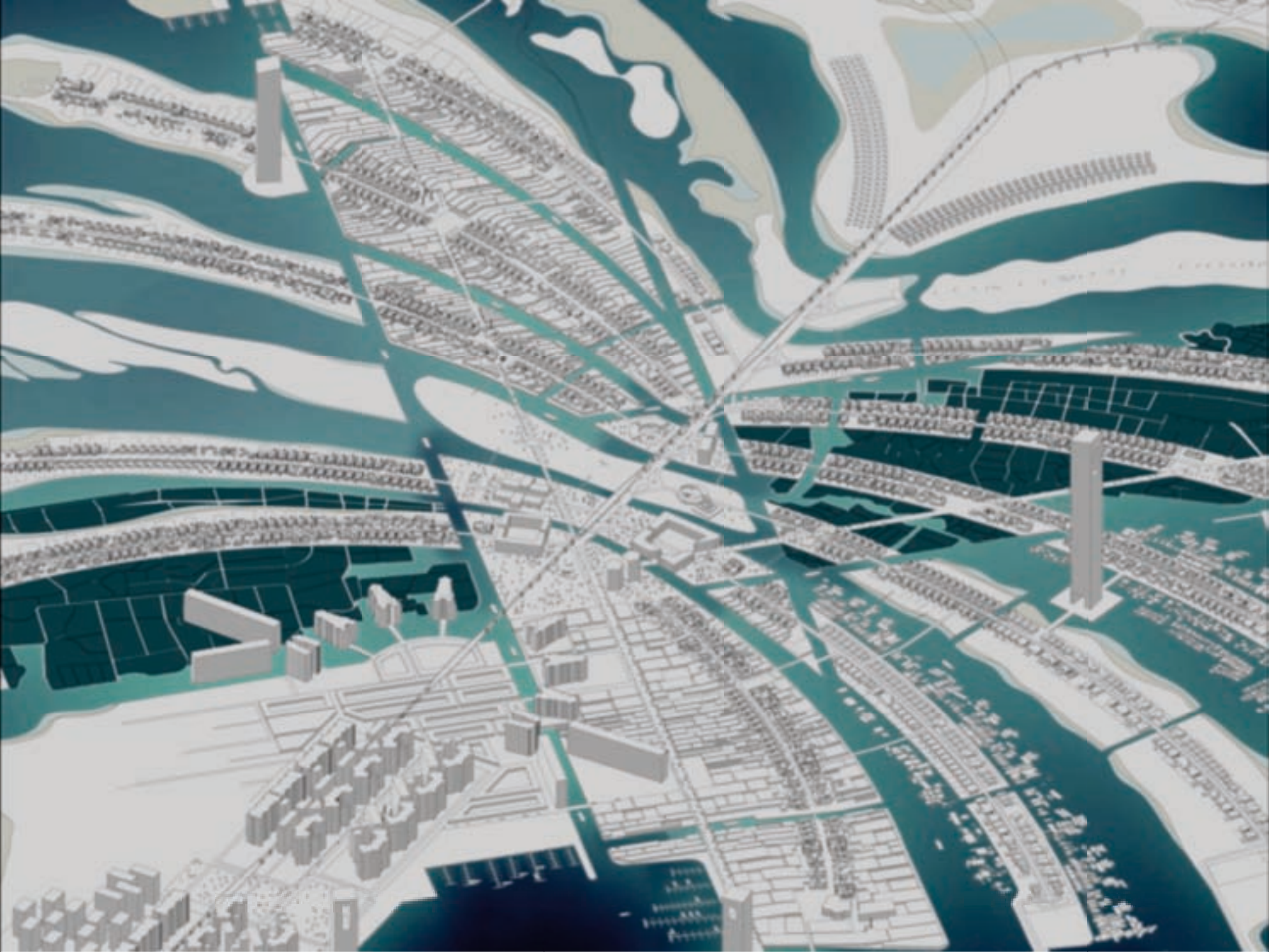
Contemporary and mainstream communication mass culture through an economy of look-at-me iconography. On the urban scale, this looking leads to a kind of eye-Monster reduced to the simplicity of a central strip: pure! However, the paper contribution is far from naive: the team doubles Dubai's coastline and creates 78 kilometers of profitable waterfront property. From further mass acts as an organizational device. Evaluated on structural level, the image of the palm tree creates a structure of control and an alternative of choices.

1. "In the case of the alternative, Dubai had become the global primary land market in the world. The world's largest investment in infrastructure was being made in Dubai. The city was a magnet for global capital and was being marketed as the most attractive place to live and work in the world. The city was being marketed as the most attractive place to live and work in the world. The city was being marketed as the most attractive place to live and work in the world."

To retain the edge by engaging with the politics of image play it is necessary to bring image messages and its clear-cut organizational qualities and dimensions. Which central role figure what? How high can one go? Superimposing the Palm's abstract structure with a more stark to one layer of information from the air. On the level of the image, quickly captured and shared on Google Earth, the result equates a provocative statement: the Palm Jumeirah is too checked or crossed out and reaches out to a local audience. Looking closer to the ground, a local gesture can produce difference and urban complexity by connecting the formerly dispersed islands. Roads, canals and air cross elements with diagonal movement that leads travel from the water urban stage to the suburban zone.







2

re:cover

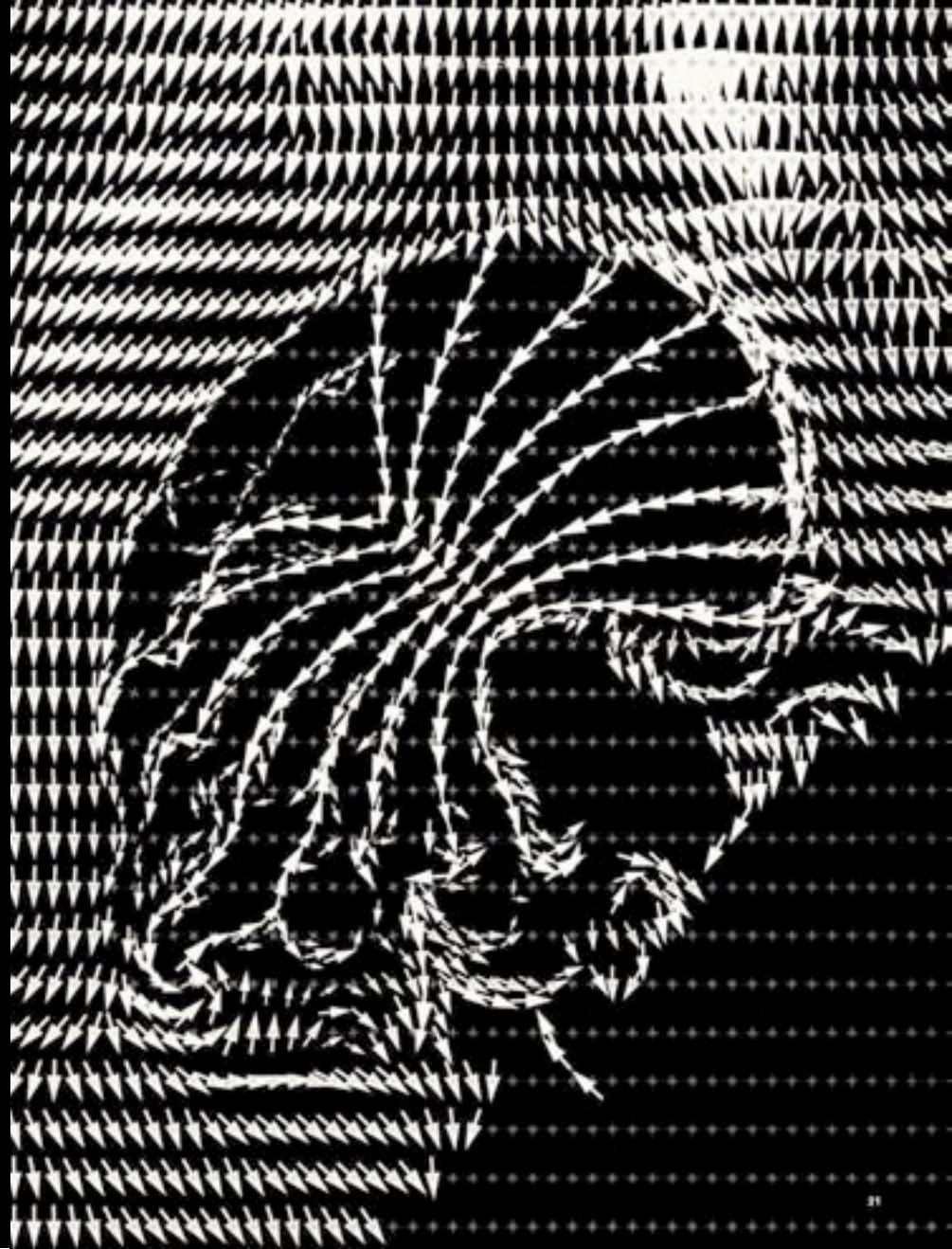
from tabula rasa to integration within dynamic environments of wind and water

The transformed city engages as a component of a larger system of environmental forces.

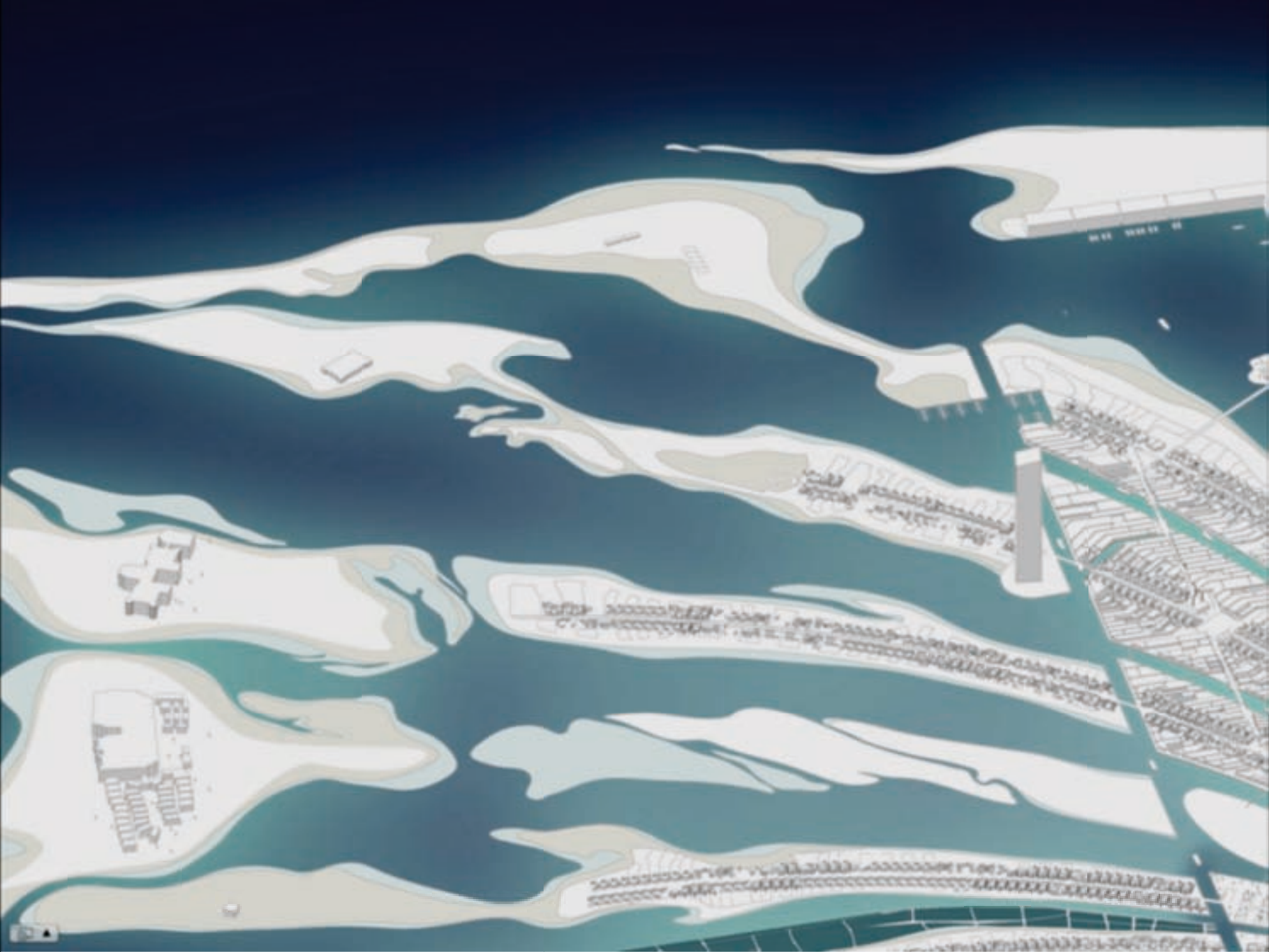
Special retreats stand in the face of environmental forces in order to provide constant conditions. The master act of cover-up, unloading the terrain's formful surface on the plan, is resource intense. This was illustrated by the momentous efforts to mould Pagan Jumeirah's breakwater, which includes seven million tons of rock, individually craned into place at the designated GPS coordinates. With huge designs or simulating a calm lagoon, the breakwater caused seawater to be stagnant. Thus, it was subsequently modified with gaps to allow for the oxygenation of water by the tides.

Carrying the remedial measure further as a proactive strategy, a directional architecture emerges. By breaking the Pagan at its narrowest points, thickening the foundations at its windward side and going over to the protection of erosion shields, the borough is both protected from and permeable to the streams of water. The by-product of adapting to the natural currents is a setting enriched with different degrees of urbanity: harbour fortifications take turns with canals that dissolve into a play of eddies, drifts and whirls.









3

re:source I

from exhaustive fossil fuels to urban geometries of sun and wind



The retrofitted city extends its morphological logics into the realm of passive and active sourcing with the mathematics of renewable energy to generate form.

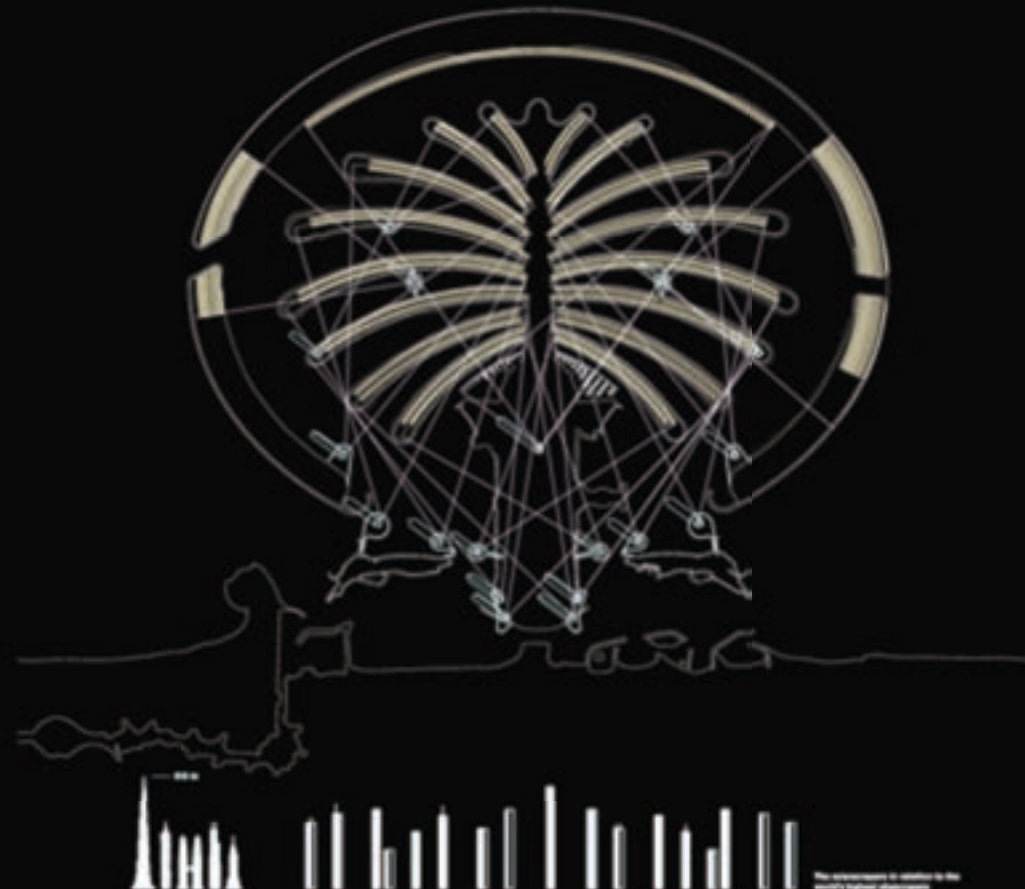
The key to any seemingly independent island is the granting of energy. The island has two problems. Firstly, its energy source is exhaustive. Secondly, energy is taken from somewhere far flung in order to fuel the mechanics of man-made weather. The distribution of decision-making and energy taking dissociates urban form and architecture from its climatic context. Thus, any connectivity to turn four seasons into a steady spring is made possible because the environmental costs are magically externalized. However, air-conditioning bills on the palm are not so magical: they can reach \$500 each a month – a sum which underlines the disappearing irreversibility of the island.

Urban form is a mirror to generate, save, lose, re-use and store energy on site. A re-examination of the existing urban structure requires elegant geometries to serve the exploitation of both wind and sun. The curvilinear design of the Palm provides a real growth opportunity for electricity generation through solar concentration. The curvilinear arrangement of heliostats power plants is adopted and installed onto the freshwater and brackish including street surfaces and site scaled to create an array of flat mirrors that focus direct sunlight towards collectors situated at the pinnacle of residential towers.

Leaving the former mono-functionality of energy generation behind, resource usage and urban form rise interlock. The great solar towers become the new Burj Jeng, toward of Dubai, logically placed in terms of solar geometry and equally impressive in terms of high-rise form.



Helioscope Power Plant, Architect: re:source architects



The arrangement is similar to the world's highest skyscraper

1. re:source architects, "Which is a smaller city, Palm Jumeirah or a city like New York?" (London: The Architects' Journal, 17 Feb. 2006)



