



## HafenCity Hamburg: Ecological Sustainability Strategies in a Large-Scale Urban Development Project

**Hape Schneider**  
Assistant to the CEO

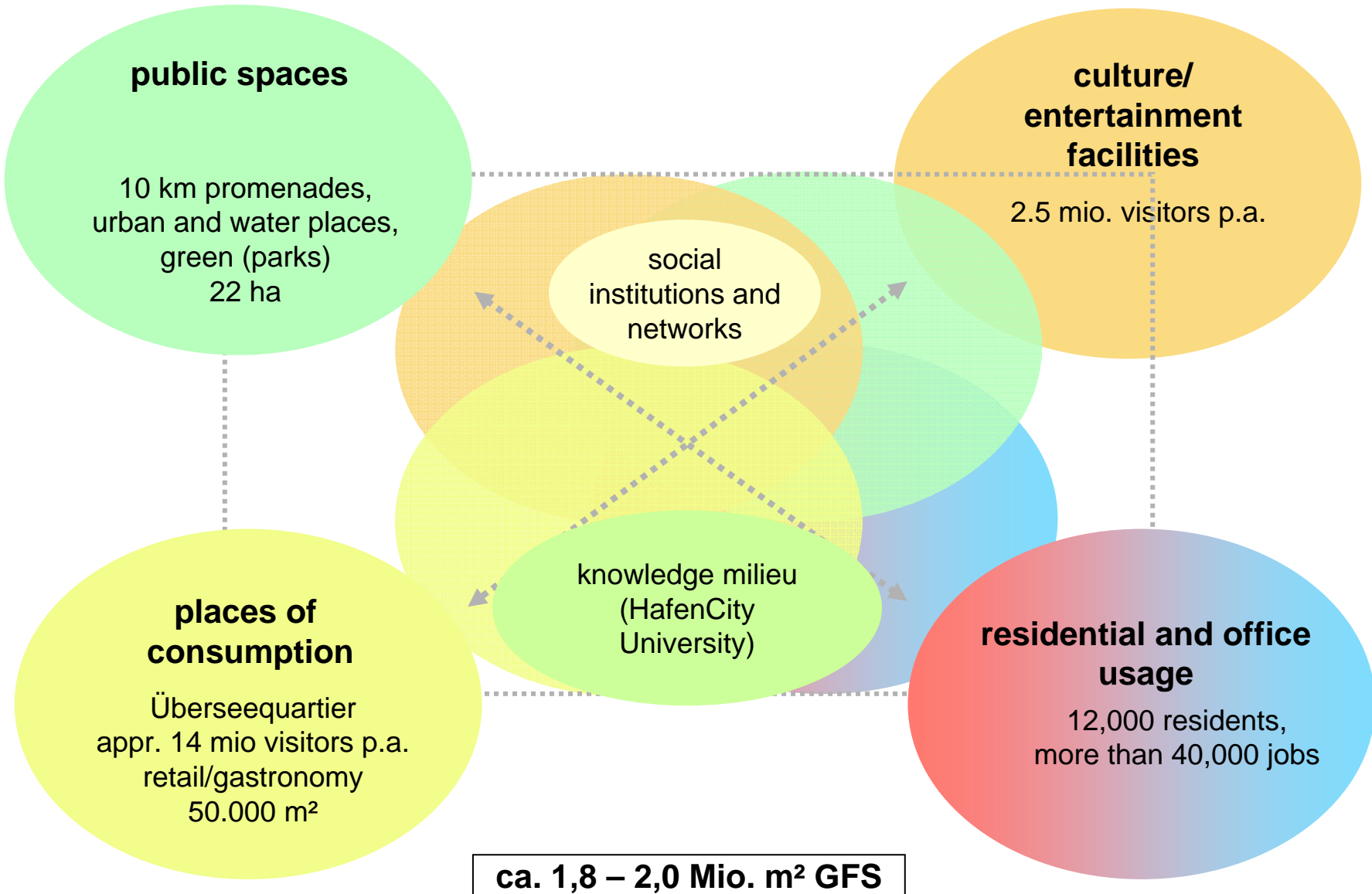
**Danish Architects and Engineers**  
10 October 2008














**HafenCity: 155 ha area**

- waterfront: 10 kilometers
- inner city area: increase by 40%












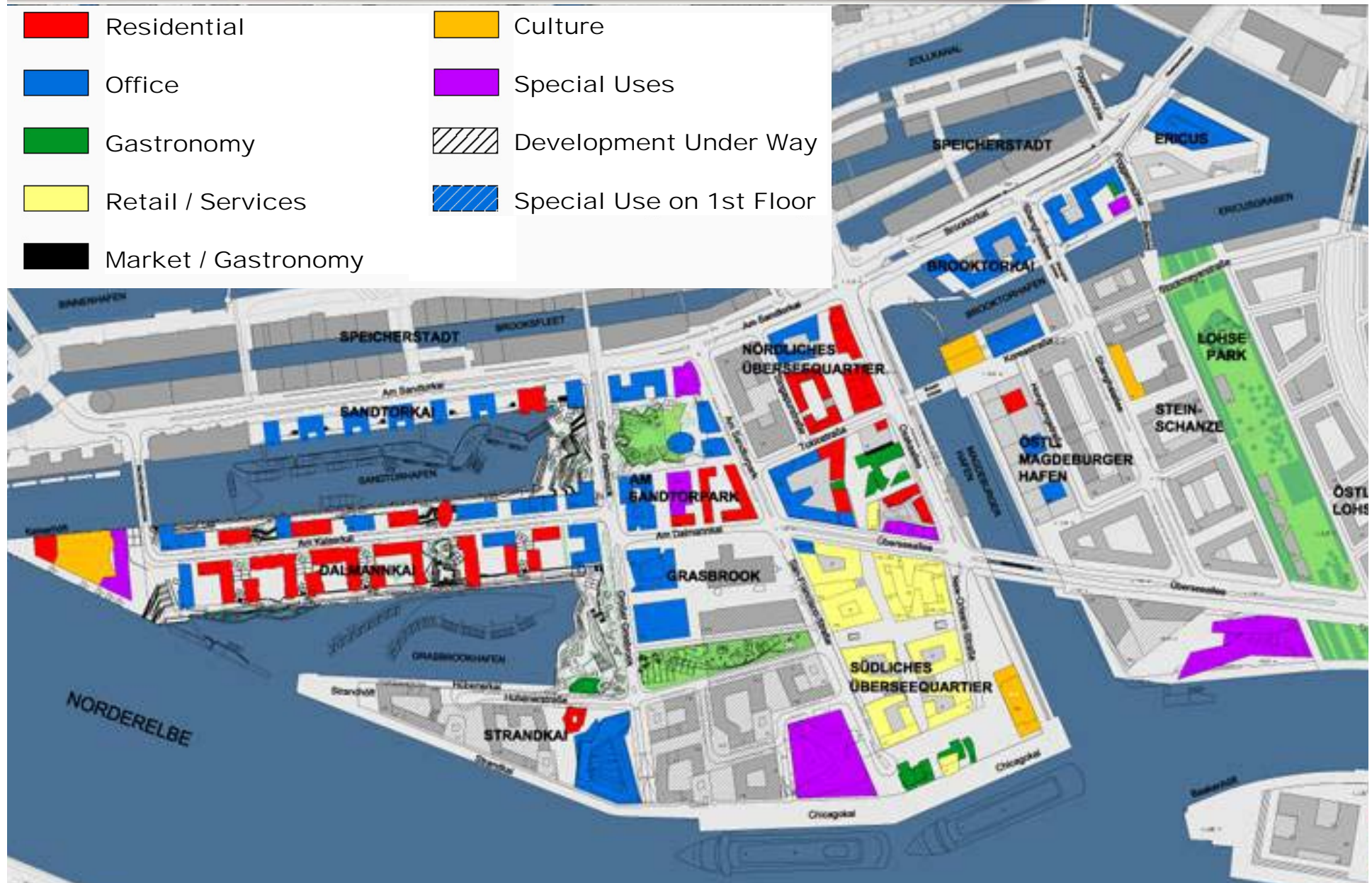
# MIXTURE OF USAGES IN BUILDINGS: GROUND FLOOR

- |   |                     |   |                          |
|---|---------------------|---|--------------------------|
|  | Residential         |  | Culture                  |
|  | Office              |  | Special Uses             |
|  | Gastronomy          |  | Development Under Way    |
|  | Retail / Services   |  | Special Use on 1st Floor |
|  | Market / Gastronomy |   |                          |



# MIXTURE OF USAGES IN BUILDINGS: FIRST FLOOR

- |   |  |
|---|--|
|  Residential         |  Culture                  |
|  Office              |  Special Uses             |
|  Gastronomy          |  Development Under Way    |
|  Retail / Services   |  Special Use on 1st Floor |
|  Market / Gastronomy |  |



# IMPORTANT NEW CULTURAL PLACES „ICONS OF IDENTITY“



# CULTURAL INSTITUTIONS: ELBPHILHARMONIE / INTERNATIONAL MARITIME MUSEUM



# PUBLIC SPACES: DALMANNKAI PROMENADE 10 KILOMETERS NEW PUBLICLY ACCESSIBLE WATERFRONT





# PUBLIC SPACES AT AND ON THE WATER MAGELLAN TERRACES



# NACHHALTIGE URBANITÄT: VASCO-DA-GAMA-PLATZ



# PUBLIC SPACES AT THE WATER: MARCO-POLO-TERRACES



# STATUS OF DEVELOPMENT



## Hamburg City State Government

### Administrative structure and responsibilities

#### SPECIAL PLANNING AREA

„HafenCity“ (since 10/2006)

- **State Comm. of Urban Development**
  - Development plans (approval)
- **Ministry of Urban Development & Envir.**
  - building permits
  - planning approval for subway link (U4)
    - main artery roads (maintenance)
  - **Chief Urban Planner/HC Working Group**
    - urban design concept
    - development plans (handling)
    - architectural quality
- **District Authority (Central)**
  - access roads, squares, parks, promenades (maintenance)
- **Hamburg Port Authority**
  - water ways
    - quay walls (maintenance)
- **Ministry of Finance**
  - coordination of real estate policy
- **Special Projects**
  - Min. of Culture (Elbphilh., IMM, Science Center)
  - Min. of Education (schools)
  - Min. of Science & Research (HafenCity University)

### HafenCity Hamburg GmbH

(wholly-owned State of Hamburg subsidiary)

#### Supervisory Board membership

#### **Heads of state ministries (senators/state minister)**

Urban Development & Environment, Economy & Labour, Finance, Education & Sports, Culture;  
State Councillor Senate Chancellery

#### Advisory Board

#### Functions of HafenCity Hamburg GmbH

1. Trustee of special budget “City and Harbour”, real estate owner and developer, financing
2. Development manager
  - pre-planning, masterplan, development plans, development planning for sections (e.g. culture, social)
  - company relocations, property development
  - flood-proof infrastructure development and construction (main artery and access roads, quay walls, promenades, squares, parcs)
  - developer/investor acquisition, property sales
  - communication and marketing
  - special projects (excl. *Elbphilharmonie*)

1. Environmental Issues
  - Noise: Compatibility of Operating Harbour with Innercity Waterfront
  - Waterfront: A New Topography
2. Urban Structure
3. Transport and Mobility
  - Subway
  - Fuel Cell Buses
4. Heating Energy Supply
5. Building Certification

# HAFENCITY AND HARD HARBOUR USES



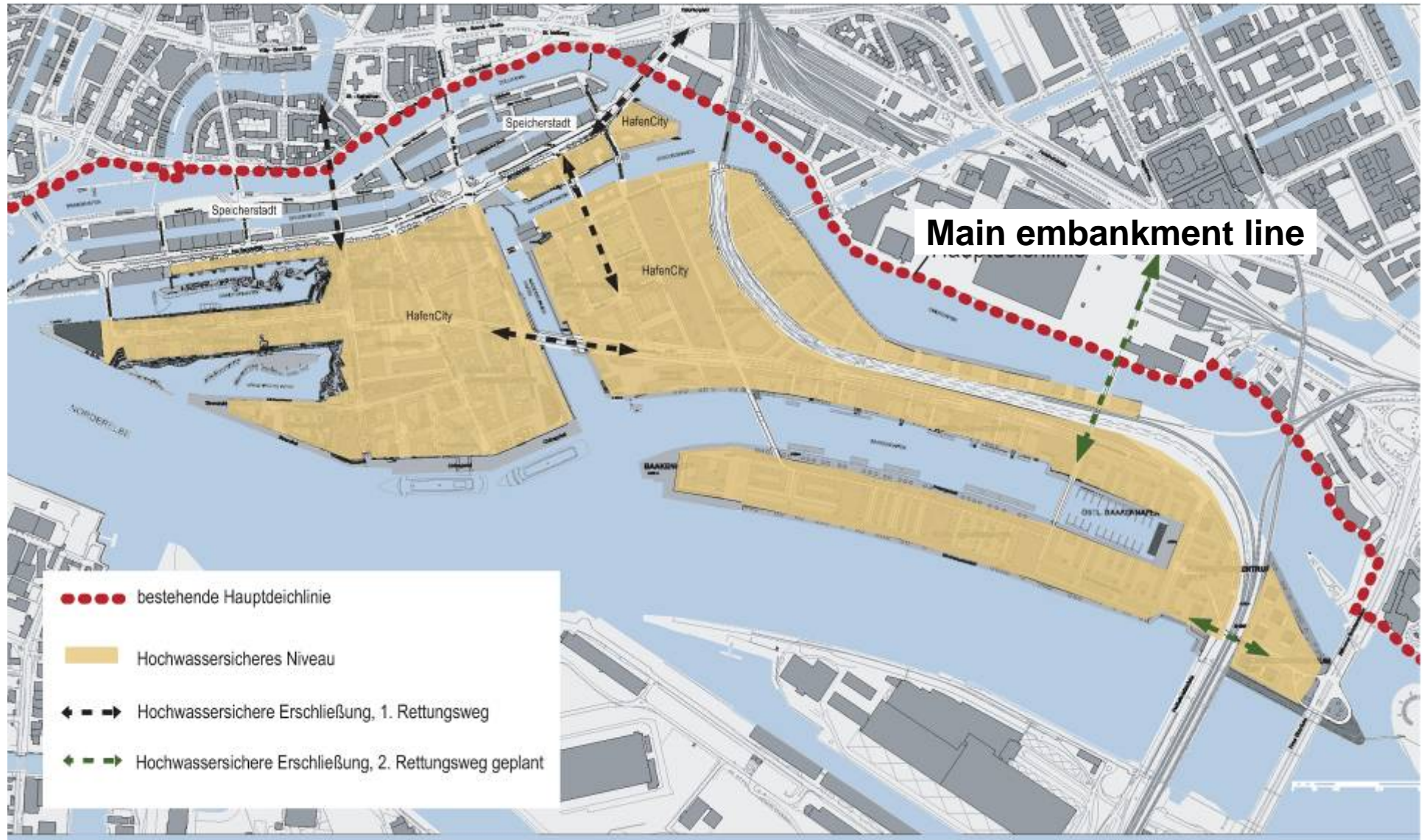
# HAFENCITY AND HARD HARBOUR NOISES

<p>Hard Harbour Area (partially)</p>	<p>Soft Harbour HafenCity</p>	
<p>Noise Cap (Harbour Planning Ordinance)</p>	<p>public regulations</p>	<p>private regulations</p>
	<p>1. development plans allow residential development without double facade</p> <p>2. building permits: specific window concepts and noise absorption / location of bedrooms</p>	<p>sales contracts: users accepting harbour noise (easement)</p>





# RISING WATER LEVEL: CONCEPT FOR FLOOD PROTECTION



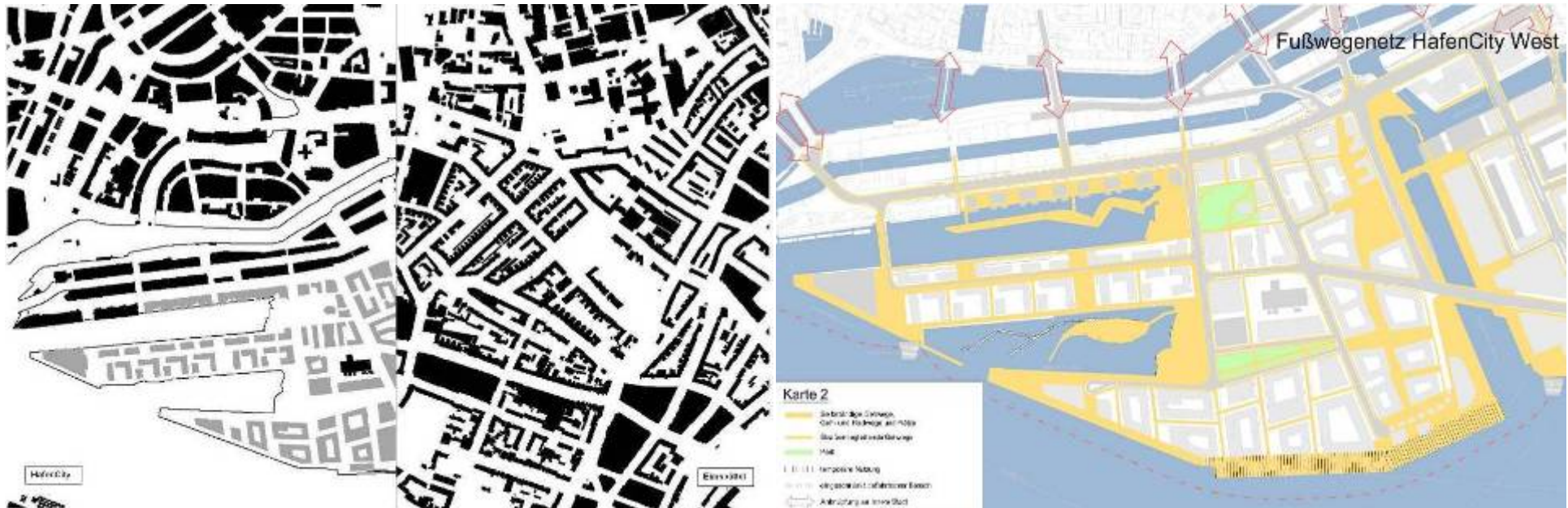
# FLOOD PROTECTION AND LAND SAVING NEW TOPOGRAPHY: UNDERGROUND PARKING LOT



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## Wide Variety of Walkways and Cyclepaths

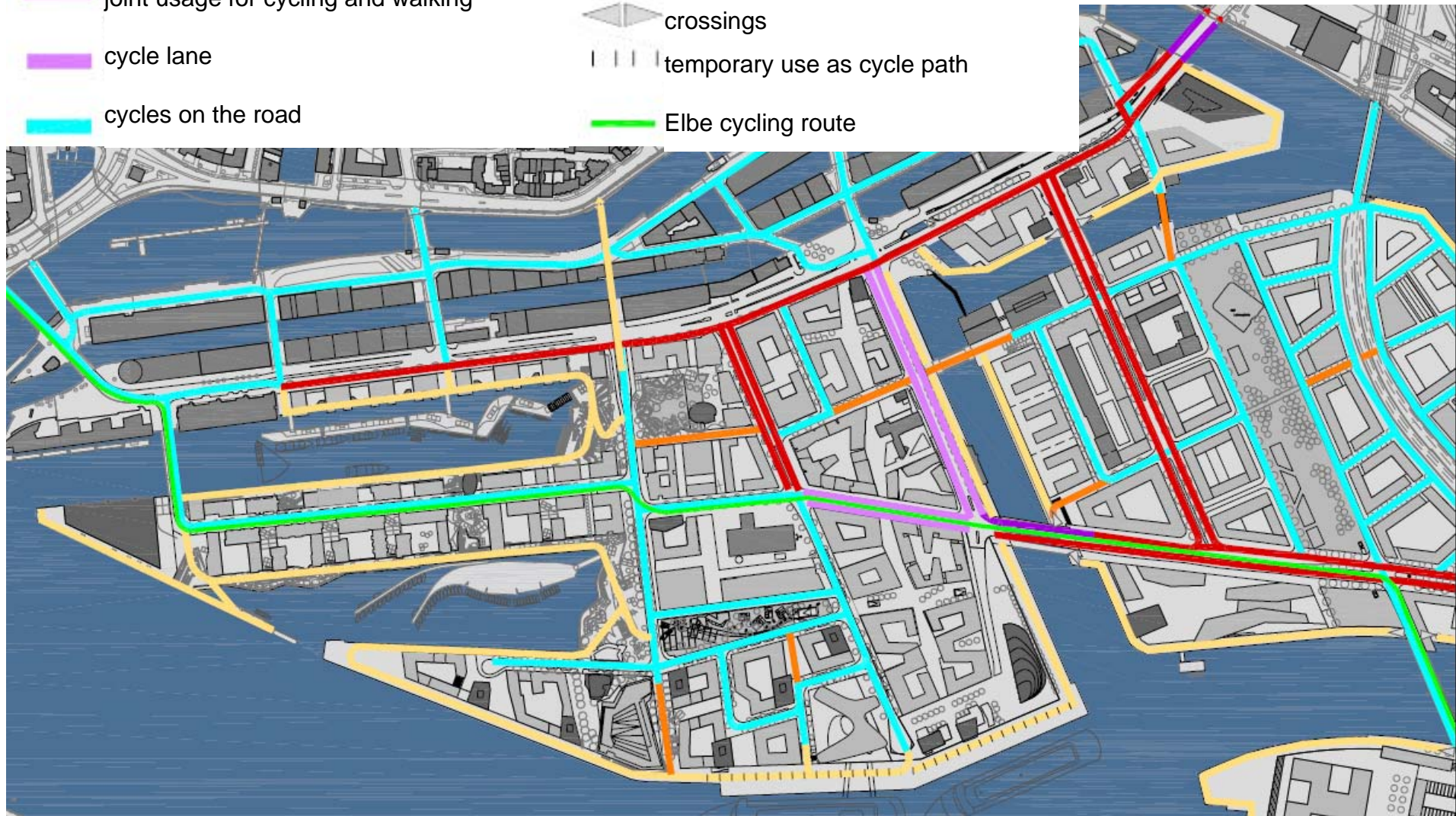
- A **dense grid of walkways and cyclepaths** covers the HafenCity. Compared to 19th century urban quarters like Eimsbüttel the urban block sizes in HafenCity are much smaller resulting in many more walkways and cyclepaths in relation to the length of the traffic grid.  
(9:5 in HafenCity compared to 6:5 in Eimsbüttel).
- **High number of traffic ways along the waterfront**



# SHORT DISTANCE MOBILITY CONCEPT: CYLCLE PATHS AND FOOTWAYS

## Cycling in HafenCity

-  cycle path next to roads
-  joint usage for cycling and walking
-  cycle lane
-  cycles on the road
-  independent cycle and walkways
-  public spaces and promenades accessible to cycles
-  crossings
-  temporary use as cycle path
-  Elbe cycling route



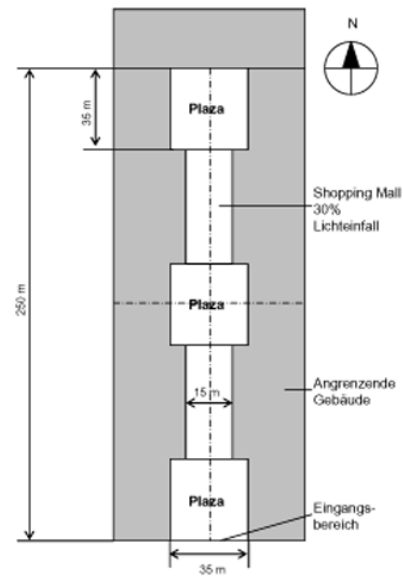
# BUILDING ECO-DENSITY

## Density:

- 158 ha total area
- 121 ha land
- 60 ha net building area
  
- 1.8 -2.0 mio m<sup>2</sup> GFS
- FSR ca. 2.5 – 3.0



# MIXED USED BUILDING DEVELOPMENT: OPEN URBAN STRUCTURE INSTEAD OF A CLOSED SHOPPING MALL



Model calculation  
[MegaWatt Engineering]:

- Reduction of **990 t/a** CO<sub>2</sub> emissions by the chosen open urban structure for the retail industry compared to a same sized shopping mall.

This corresponds to a CO<sub>2</sub> emission of 1.000 apartments (of a 100 sqm each) built according to a 60 kWh/m<sup>2</sup>a energy standard

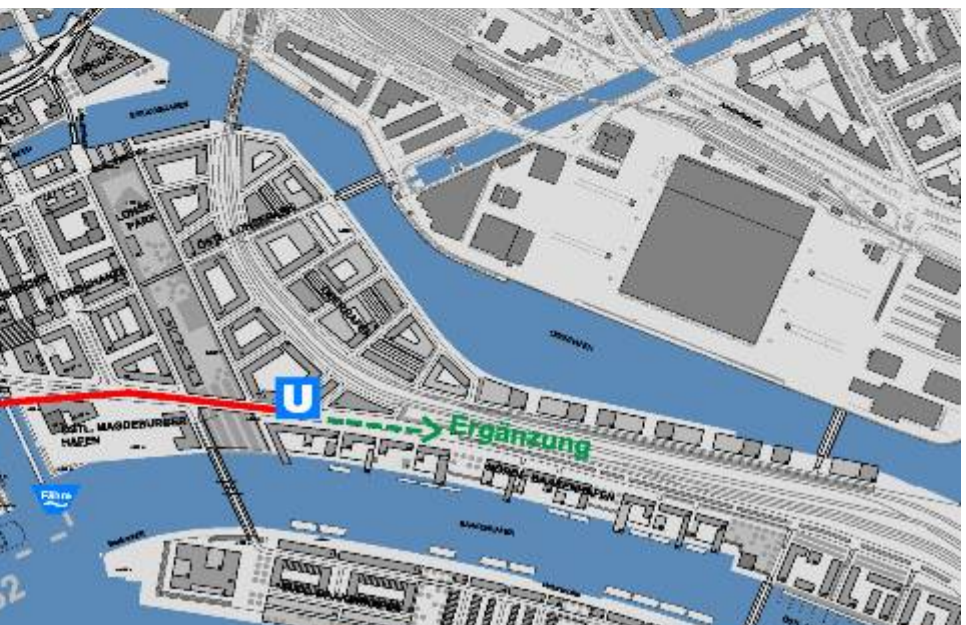
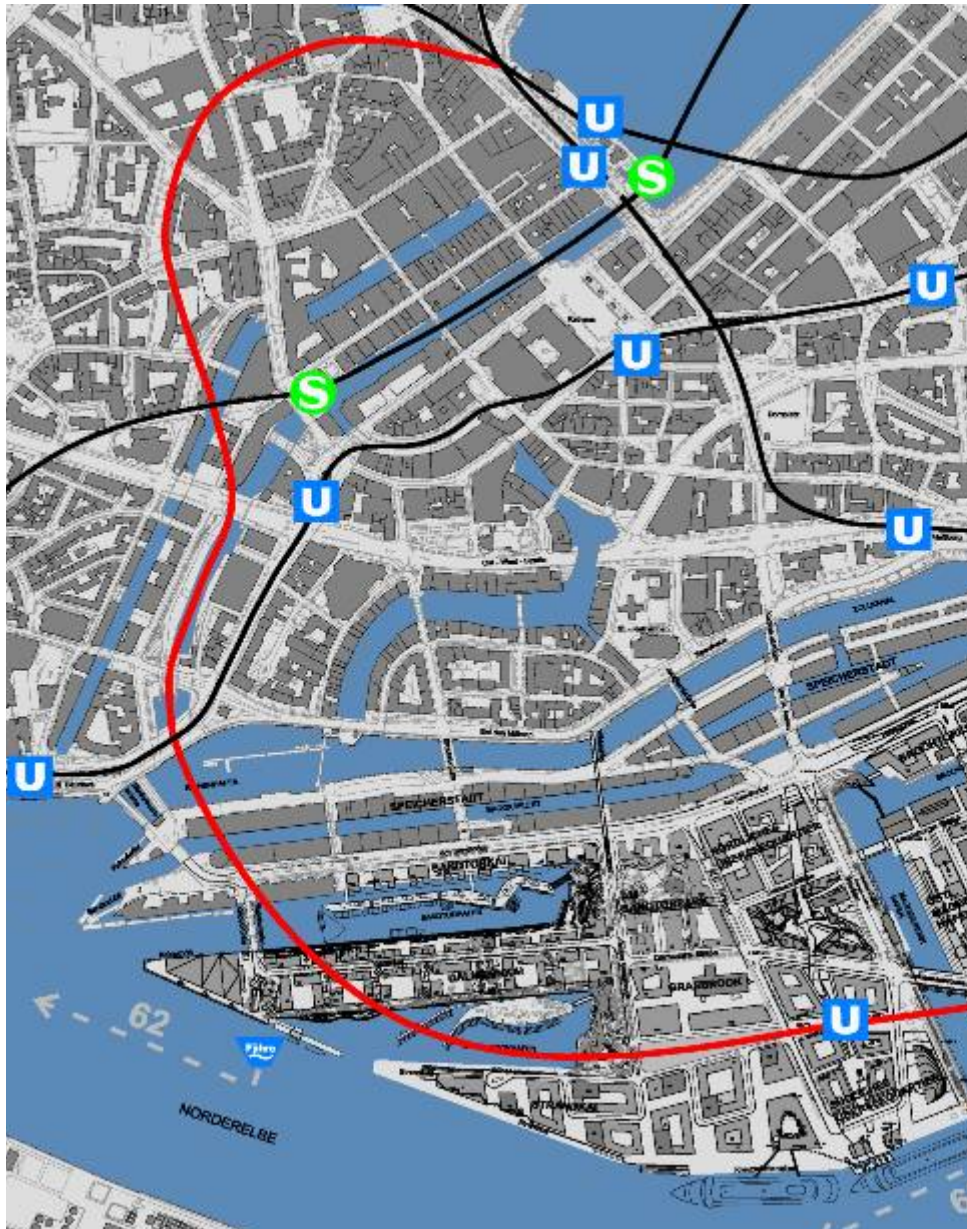


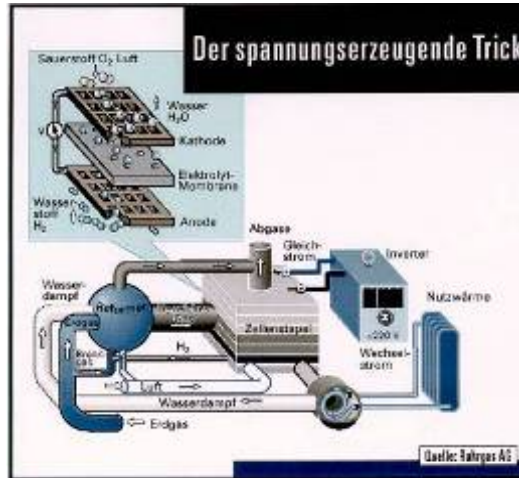
- Reduction of heating energy: 2.261 MWh/a
- Reduction of electricity: 693 MWh/a

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# MOBILITY: NEW SUBWAY U4





## Fuel-cell operated busses:

- bus line nr. 6 served by fuel-cell busses
- in cooperation with Vattenfall and Shell, Hamburg's public transport services (HVV) plan the construction of a fuel-cell station in HafenCity

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# SUSTAINABLE URBAN DEVELOPMENT : CENTRAL HEATING AND CO<sub>2</sub> BENCHMARK



## Central Heating Supply Objectives (2002):

- secured supply
- low price
- high energy efficiency
- CO<sub>2</sub>-Benchmark: below 200 g/kWh:  
target value 175 g/kWh

## Mix of Technologies:

- district heating
- solar heating
- fuel cells

Result: Reduction of emissions by central heating supply and CO<sub>2</sub> limits.  
Reduction of CO<sub>2</sub> emissions by 27% compared to natural gas use (even larger reductions possible compared to oil or coal use)

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5. **Building Certification**

## Eco Label Categories

### 1. Sustainable use of energy resources

power requirements: residential buildings:  $<60 \text{ kWh/a m}^2$  or  $<40 \text{ kWh/a m}^2$

power requirements: commercial buildings:  $<190 \text{ kWh/a m}^2$  or  $<100 \text{ kWh/a m}^2$

### 2. Sustainable use of public goods

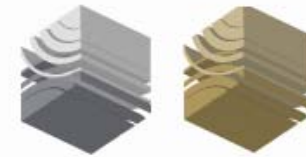
### 3. Use of environmentally friendly building materials

### 4. Special consideration for environment, comfort and health protection

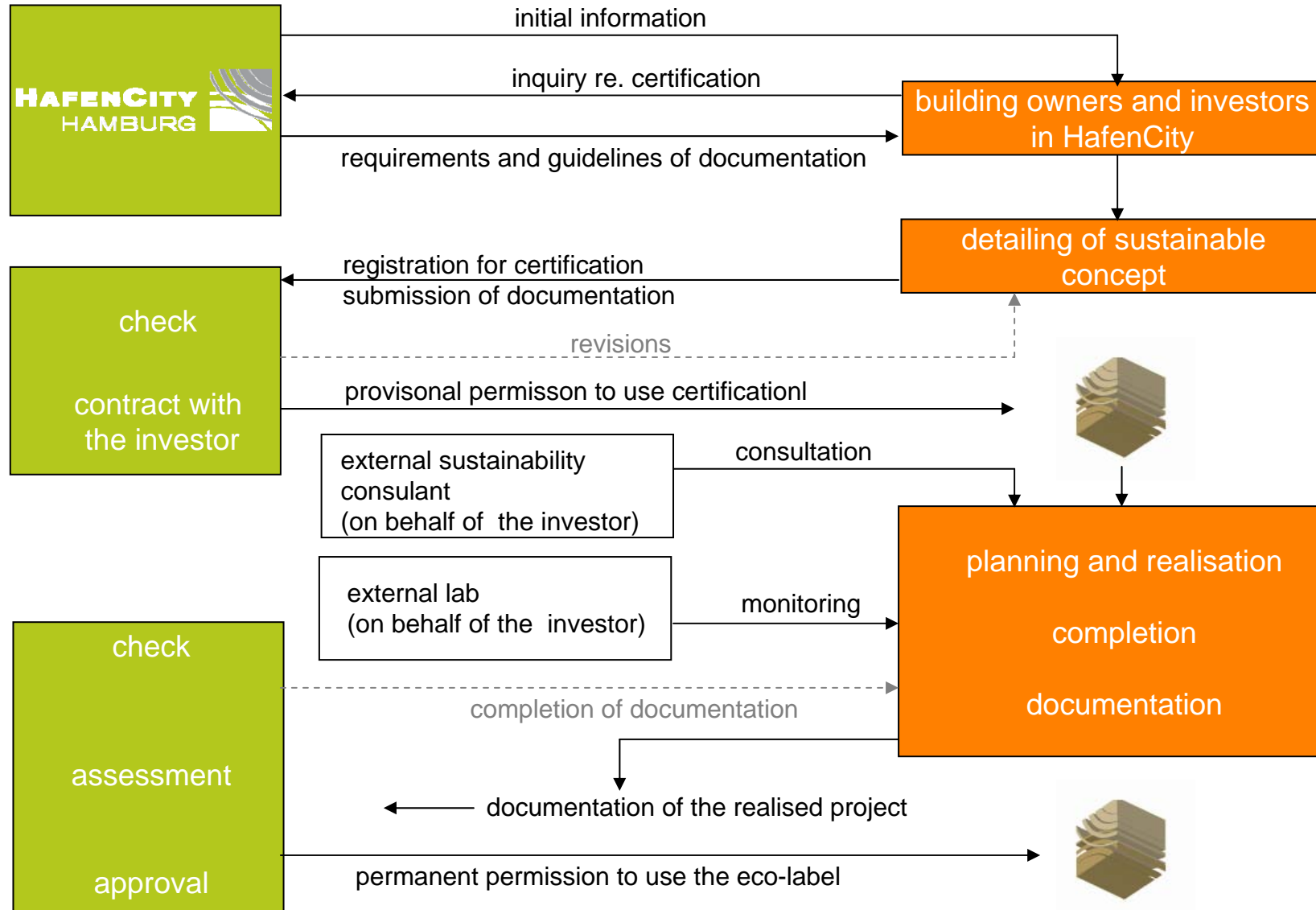
### 5. Sustainable Facility Management

## Usage of Competition and Market Processes

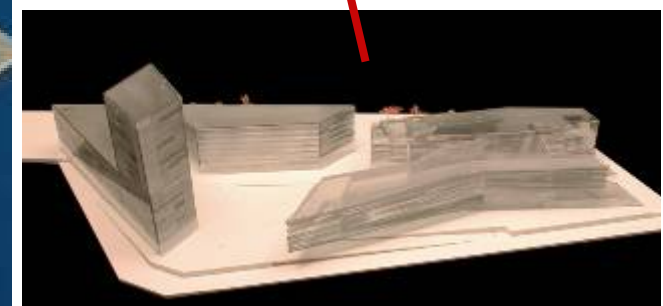
- awarding of an eco-label and conferring an environmental award
- certification of buildings
- promotion of energy efficient buildings in case of exclusive options or/and the sale of plots under competitive market conditions



# SUSTAINABLE BUILDING: PROCESS OF CERTIFICATION



# MODEL PROJECTS FOR SUSTAINABLE BUILDING: HCU / WÖLBERN / GREENPEACE / SPIEGEL / UNILEVER / ÜSQ













THANK YOU FOR YOUR ATTENTION !



Hape Schneider  
Assistant to the CEO

## Einzelmaßnahmen zur Erreichung des Gebäude-Zertifizierungsstandards "Gold" in den Kategorien 1-5, exemplarisch aufgestellt für die Projekte:

 Spiegel 	 Unilever 	 Hafencity Universität 		
<b>Kategorie 1: Nachhaltiger Umgang mit energetischen Ressourcen</b>	<b>Kategorie 2: Nachhaltiger Umgang mit öffentlichen Gütern</b>	<b>Kategorie 3: Einsatz umwelt-schonender Baustoffe (Silber)</b>	<b>Kategorie 4 : Bes. Berücksichtigung von Gesundheit und Behaglichkeit</b>	<b>Kategorie 5: Nachhaltiger Gebäudebetrieb</b>
<ul style="list-style-type: none"> <li>▪ Gesamtprimärenergiebedarf von &lt; 100 kWh/m<sup>2</sup>a, verbesserter Wärmeschutz</li> <li>▪ Geothermie: 70 Erdsonden, ca. 100 m Tiefe zum Wärmetausch</li> <li>▪ Beleuchtung tageslicht- und präsenzabhängig gestaltet, Energiesparlampen</li> <li>▪ Thermische Bauteilaktivierung</li> <li>▪ Photovoltaik zum Betrieb der Wärmepumpen</li> </ul>	<ul style="list-style-type: none"> <li>▪ Öffentlich zugängliches Atrium im Erdgeschoss</li> <li>▪ Öffentlich zugängliche Nutzungen im Erdgeschoss (Dove Spa, Unilever Shop)</li> <li>▪ Öffentliches Cafe und Mitarbeiterrestaurant an der Uferpromenade</li> <li>▪ Intensive Begrüßungsmaßnahmen auf dem Grundstück, Dachbegrünung</li> <li>▪ Grauwassernutzung für die Bewässerung der Außenbepflanzung</li> <li>▪ Kein Schwermetalleintrag in Gewässer</li> <li>▪ Wasserlose Urinale</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hoher Einsatz nachwachsender Rohstoffe: Holzfenster, Doppelböden etc.</li> <li>▪ Verzicht auf PVC und halogenhaltige Baustoffe</li> <li>▪ Verzicht auf Holz aus entfernten tropischen Ländern</li> </ul>	<ul style="list-style-type: none"> <li>▪ Allergikergerechte Ausstattung (Pollenfilter, keine Lösungsmittel)</li> <li>▪ Hoher hygienischer und behaglicher Komfort: Mineralische Farben, im Innern nur emissionskontrollierte Produkte</li> </ul>	<ul style="list-style-type: none"> <li>▪ Dauernde und nachhaltige Analyse und Optimierung der Betriebsprozesse</li> <li>▪ Aufstellen und Führen eines Gebäudebetriebshandbuchs</li> <li>▪ Komplettes Facility-Management</li> </ul>