

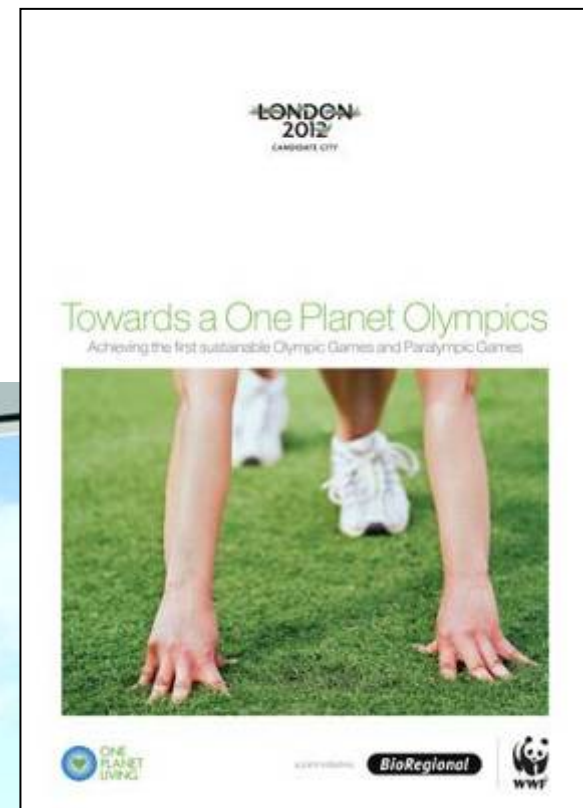


Ottawa | Washington DC | Sonoma | London | Lisbon | Dubai | Adelaide | Johannesburg | Shanghai

Greg Searle, Executive Director
BioRegional North America

ONE PLANET OLYMPICS

- Sustainability framework for greenest games ever
- Helped win bid
- Legacy of green Olympic village
- Largest new urban park in Europe for 150 years
- 9.5m tickets
- 12m meals over 60 days
- 299 gold medals



A diverse group of approximately 20 people, including men and women of various ethnicities, are standing on a balcony. They are leaning on a metal railing with a wire mesh. Behind them is a modern building with large windows and a colorful flag on the roof. The scene is outdoors on a sunny day.

BioRegional

Solutions for sustainability

Ecological Footprint:

“‘True north’ when it comes to sustainability”

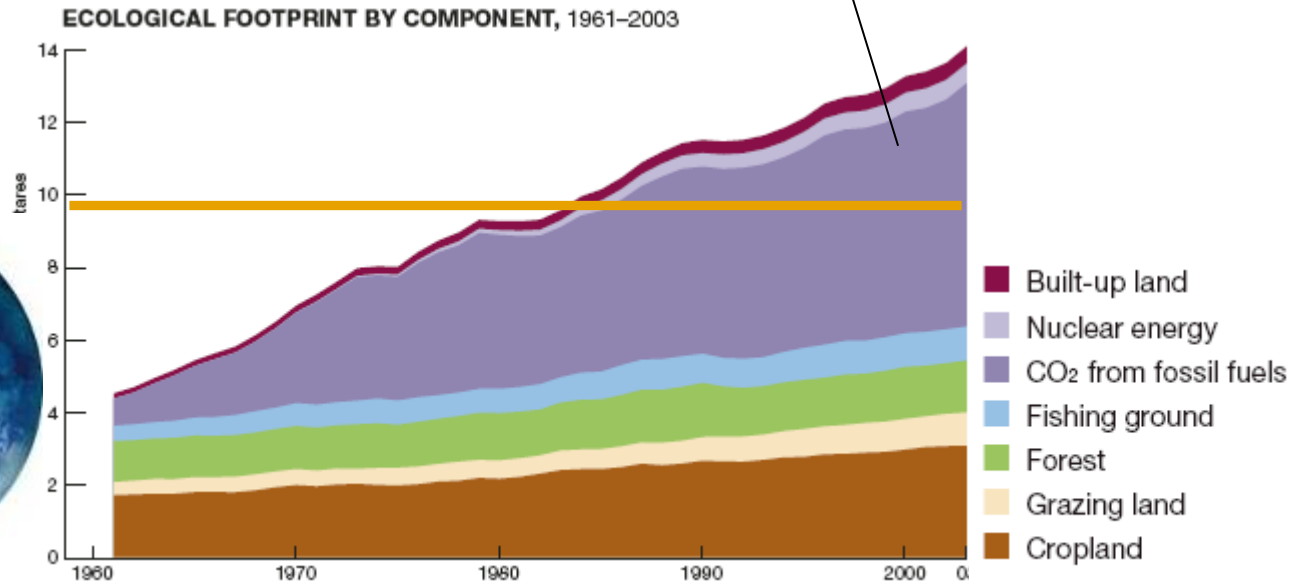
-Paul Hawken

“The most ingenious way of communicating unsustainability to the general public”

-Prof. Karl-Henrik Robert



Our Ecological Deficit (or Overshoot)



Globally, our Ecological Footprint is **30%** larger than what the planet can regenerate... and climbing steadily.

Your home, office, food, energy, car & food
Your household waste & greenhouse gases

27.7 billion acres

22% of earth's surface is "bio-productive"

24.7m acres of arable land lost per year

6.5 billion people

11.2 billion by 2100

4.4 global acres

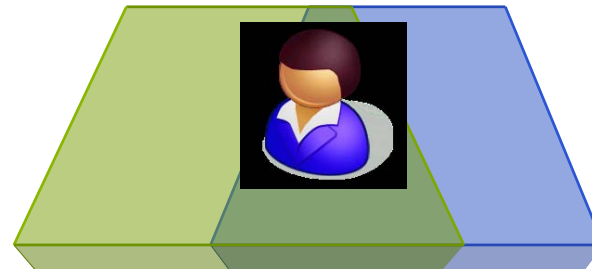
of bioproductive land/ocean per human



Footprint of a Person



**Fair share:
4.4 global acres**



**Average American:
23.7 global acres**

Footprint of a City



Ontario, Canada

Great Lakes
94,680 sq. miles

South Carolina + West Virginia + Maryland + Hawaii + Massachusetts + Vermont + New Hampshire + New Jersey + Connecticut + Rhode Island

Toronto's Footprint
124,844 sq. miles

Toronto
2,656 sq. miles

Lake Superior

Lake Michigan

Lake Huron

Lake Erie

Lake Ontario

The background is a stylized illustration. A large hand in a red sleeve holds a large globe. Inside this globe are three smaller globes, each with a different color scheme: one in shades of blue and purple, one in shades of pink and purple, and one in shades of yellow and blue. The hand has a white wristband with three 'X' marks. The overall style is graphic and illustrative.

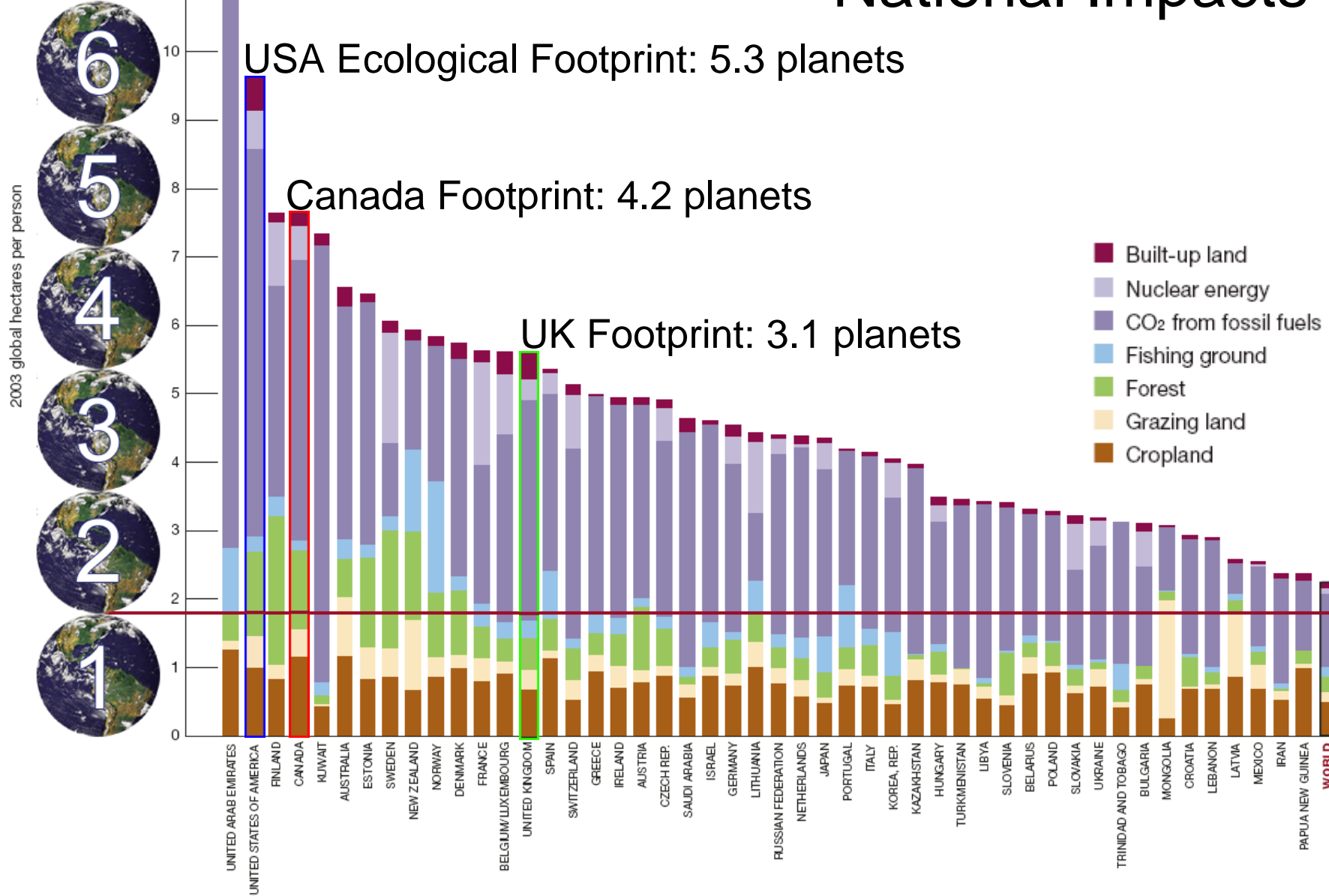
The
Economist

How many planets?

A survey of the global environment | July 6th 2002

Asymmetric National Impacts

ECOLOGICAL FOOTPRINT PER PERSON, BY COUNTRY, 2003





ONE PLANET LIVING PROTOTYPE
BedZED

BedZED

Answering the 3-planet challenge



- Planned in mid-90s; completed 2002
- BioRegional + Bill Dunster + Peabody
- Suburban, south London (25 min. by train)
- Mixed-use development on 4 acre lot
- 96 homes (density of 108/acre)
 - 48 market-rate homes/condos
 - 23 workforce housing (key-worker) homes
 - 25 low-income homes
- 10 office / work units plus community facilities





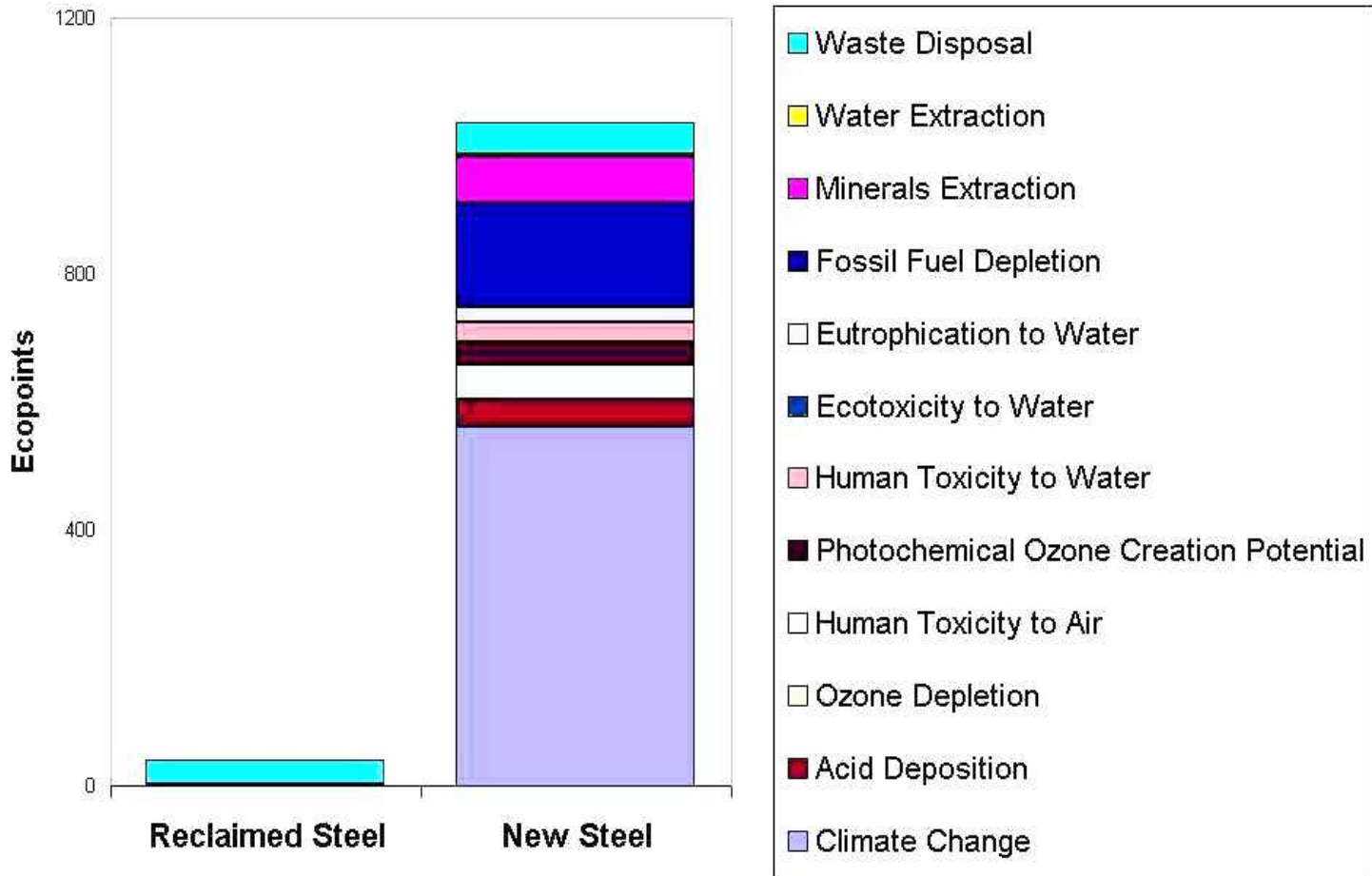




- 100% of structural steel locally reclaimed
- 83% of all timber reclaimed or FSC certified
- 52% of materials sourced within 35 mile radius
- 3404 tons of materials were reclaimed & recycled



Environmental Profiling





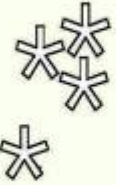
- Dockside green ZENON MBR



EXPOSED
THERMAL
MASS



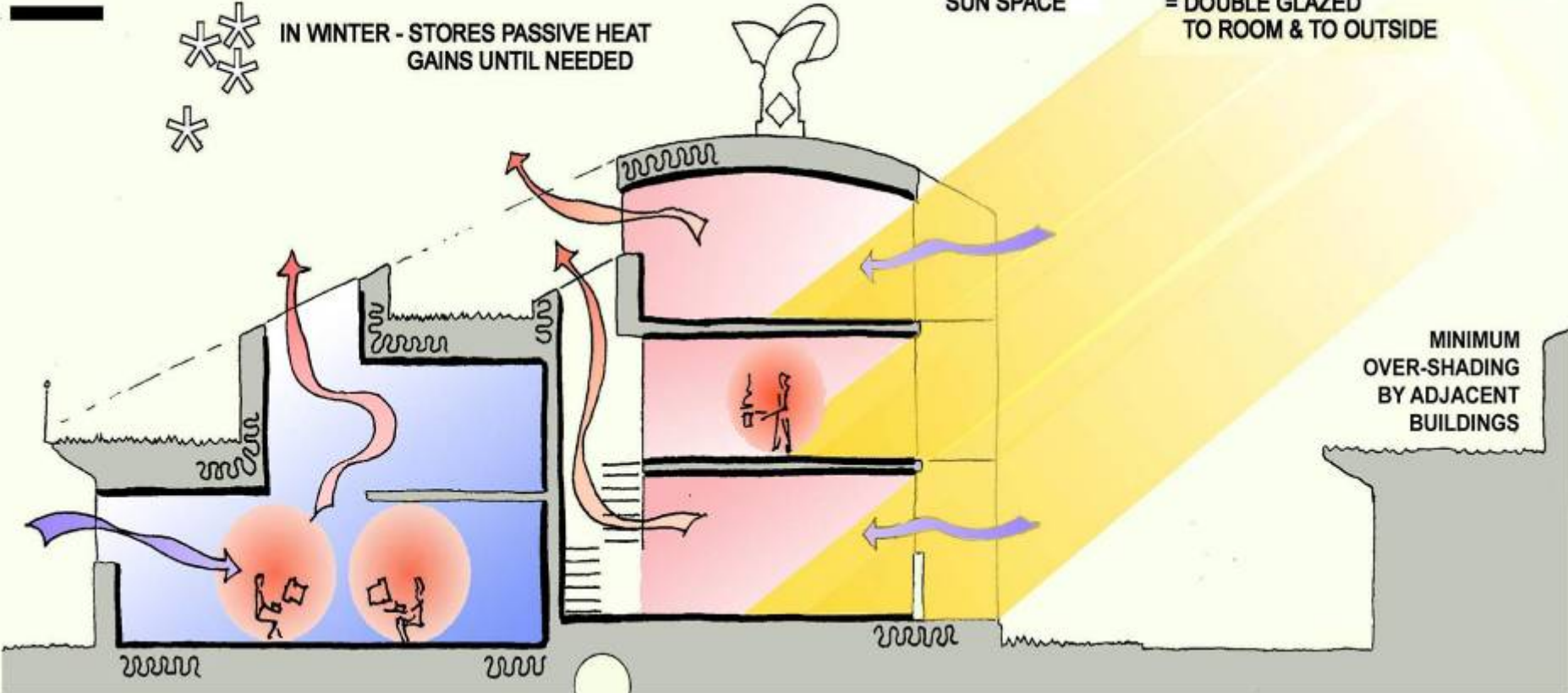
IN SUMMER - PRODUCES COOLING



IN WINTER - STORES PASSIVE HEAT
GAINS UNTIL NEEDED

HIGHLY INSULATED
WINDOWS
AIRTIGHTNESS
SUN SPACE

= $0.1W/m^2k$
= TRIPLE GLAZED
= 2 AC/HR @ 50Pa
= DOUBLE GLAZED
TO ROOM & TO OUTSIDE



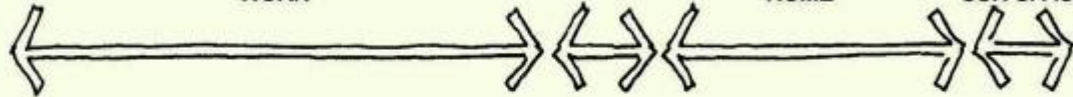
MINIMUM
OVER-SHADING
BY ADJACENT
BUILDINGS

WORK

CIRCULATION

HOME

SUN SPACE



NORTH FACING WINDOWS
GOOD DAYLIGHT
MINIMUM SOLAR HEAT GAIN

EXTENSIVE SOUTH FACING GIVING
GOOD, PASSIVE SOLAR HEAT GAIN
GLAZED BUFFER SUN SPACE.
MINIMUM NORTH GLAZING FOR
DAYLIGHT.





- **108 kilowatt** photovoltaic system
- Includes 1138 solar panels





•**130 kilowatt waste biomass CHP**
(Combined Heat and Power) provides electricity and hot water to all buildings.



- 21 tons of woodchip/week
- 3 miles to source









- Average BedZED resident uses 87 litres less water per day



An aerial perspective of a modern residential development. The buildings are multi-story with brown brick facades and extensive green roofs. Solar panels are visible on the roofs, and numerous white electric vehicle charging stations are distributed across the green spaces. The surrounding area includes trees, walkways, and a few cars parked on the street.

**Car-free
village center**

**Reduced paving =
capital cost
reduction**

**40 electric car
charging stations
(solar powered)**

**Under-parked:
.80 ration**

**Home Zone:
20mph speed
limit**



Sustainable Transport

	Local average	BedZED	Reduction
Car ownership (vehicles/person)	1.2	0.6	50%
Mileage – private fossil fuel vehicles (miles/year/person)	6,000	2,061	65%
CO ² emissions from private transport (tonnes/year)	2.2	0.9	60%

BedZED's Green Transport strategy saves

1.3 tons CO₂ / person / year



Lifestyles: Quality of Life @ BedZED

- Number of neighbours survey
- Social events - variable
- Community Gardens
- Book club
- Residents' Association
- Culvers House play area
- Pedestrian crossing
- Swapping and re-use
- Community centre
- Safety & Security
- Shared Child-care, on-site daycare





Conclusions

from BedZED

Carbon Savings @ BedZED:

5.1 tons CO₂ per person p.a.

- 39% waste biomass CHP, 2% PV
- 9% in building efficiency/passive solar
- 44% of total carbon savings in ***lifestyles***:
food, transport, waste

**1. Lifestyles *as important*
as green buildings**

Breaking down the 5.3-planet challenge





Stockholm Environment
Institute footprint audit
of BedZED



**2. True OPL achievable only
@ neighborhood scale**

1-planet
workplaces



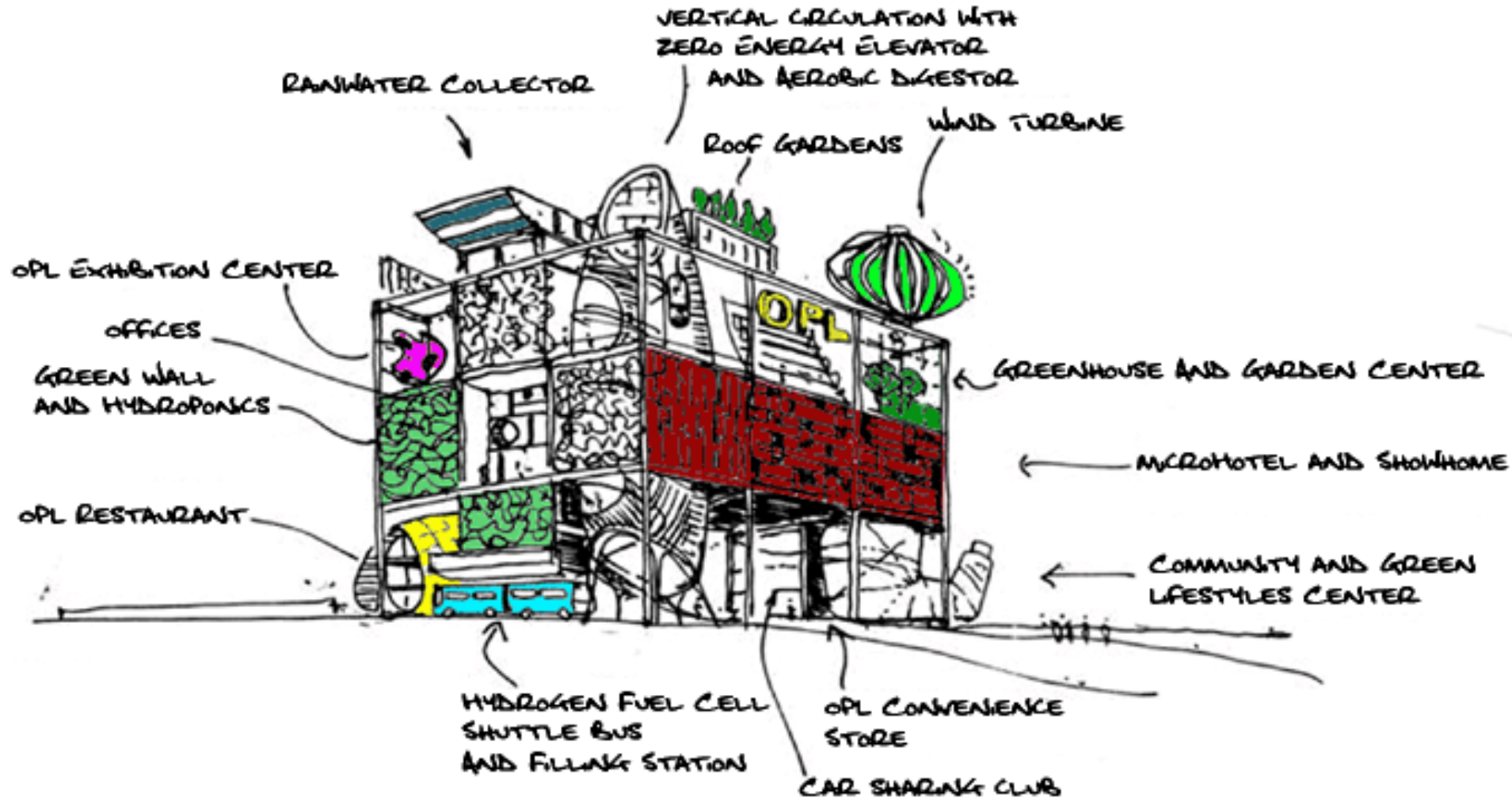
On-site amenities

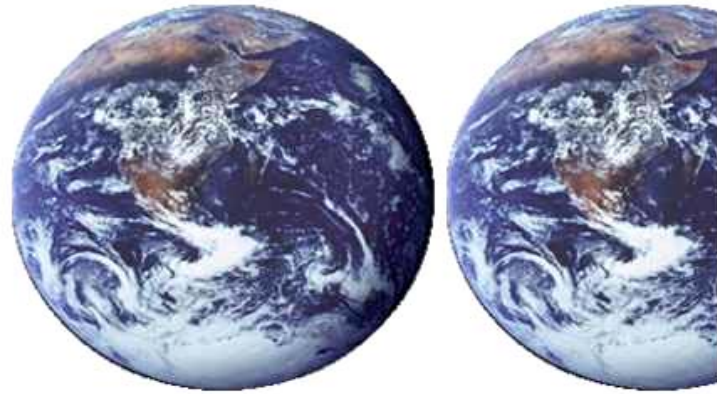


1-planet School



1-planet
grocery store





3. Footprinting: a powerful neighborhood measurement



1	Zero Carbon
2	Zero Waste
3	Sustainable Transport
4	Local and Sustainable Materials
5	Local and Sustainable Food
6	Sustainable Water
7	Natural Habitats and Wildlife
8	Culture and Heritage
9	Equity and Fair Trade
10	Health and Happiness

4. Next-generation Integrated Design *and* operation

- Dozens of awards
- 100s of press mentions
- 15,000 registered visitors
- On-site professional development
- Policy Outcomes:
 - all new British homes zero carbon by 2016;
 - \$18,000 rebate for new zero carbon homes;
 - Mayor of London mandating zero carbon demonstration neighborhoods in each borough

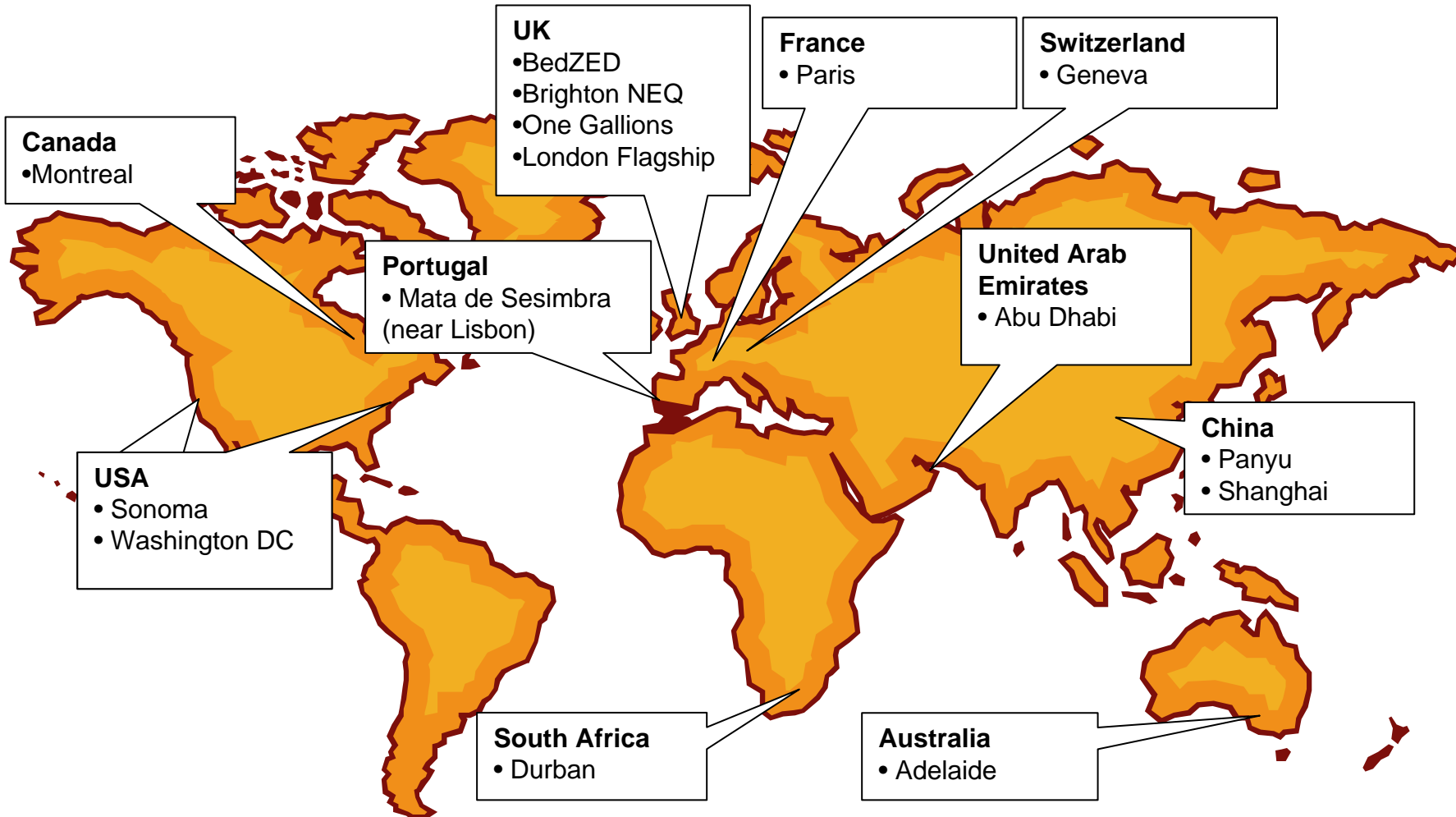


**5. “Hyper-models”
can become catalysts**



ONE PLANET
Communities

The One Planet Communities Network



Mata de Sesimbra

Portugal



One Gallions

London, UK





Brighton NEQ

Brighton, UK

Panyu

China

Towards a OPL Community in Panyu 招商地产广州项目“一个地球生活”社区研讨会



Sonoma Mountain Village

Sonoma County, California



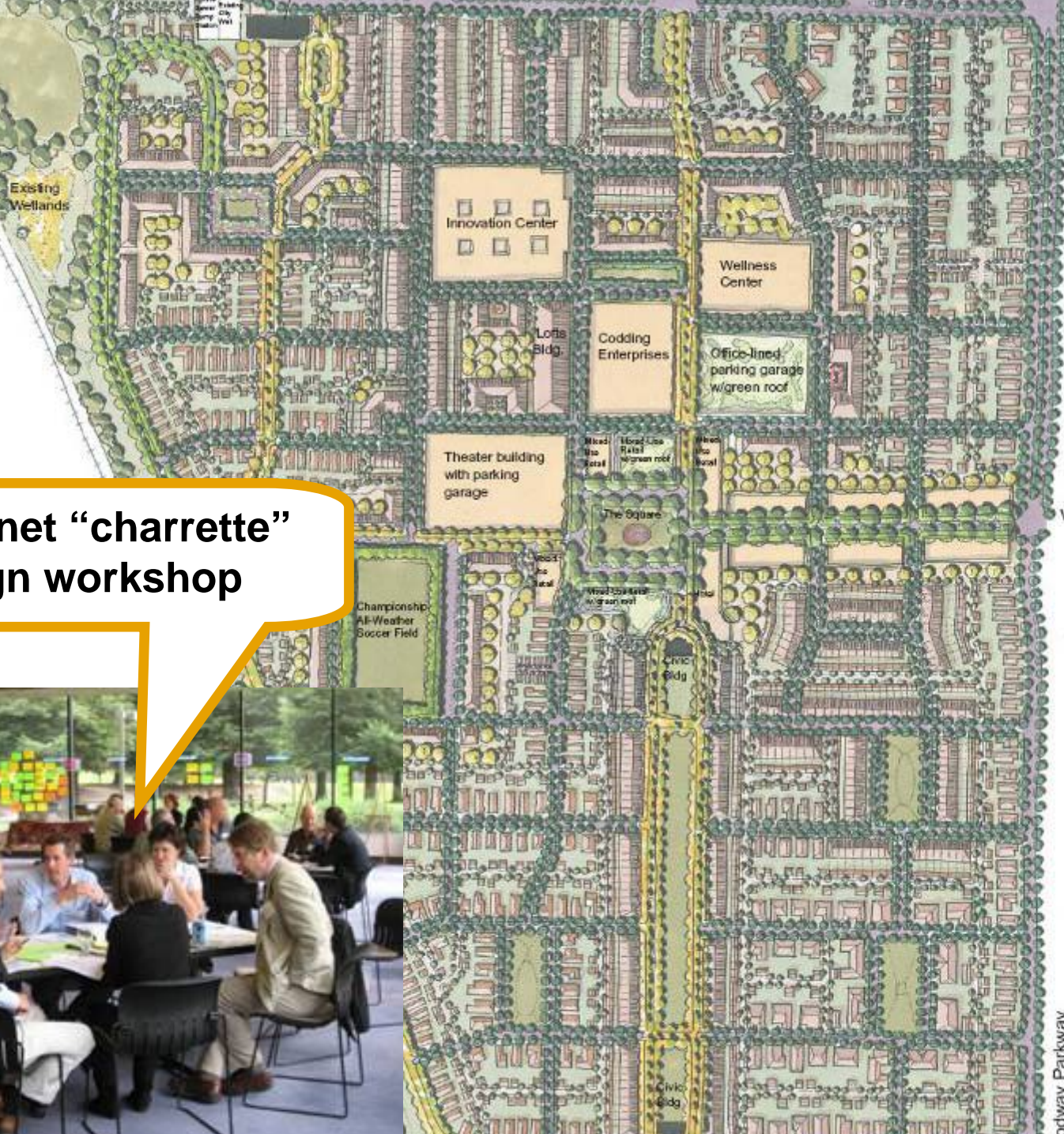


SONOMA MOUNTAIN VILLAGE

Key Facts

- Developer: Coddling Enterprises
- \$1 billion project
- 175 acres
- Adaptive reuse of over 700,000 sq ft of existing buildings
 - 1892 homes, town-homes, and condominiums
 - 289,000 square feet of office space
 - 182,500 square feet of retail
- \$7.5 million, 1.3 megawatt, 90,000-square-foot PV array to power 1,000 homes

**1-planet "charrette"
design workshop**



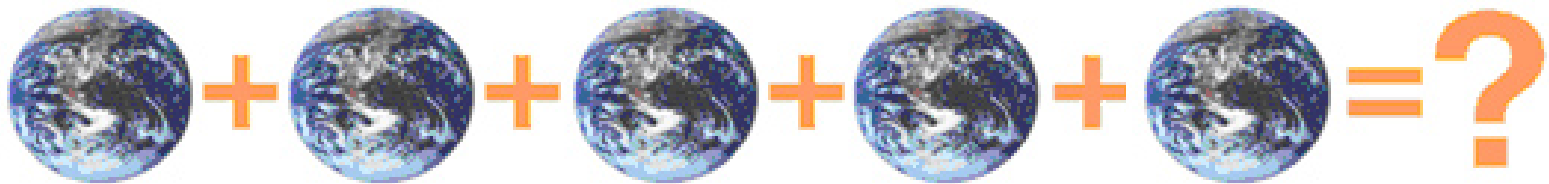
Valley House Drive



Roadway Parkway

Why?

the 5-planet challenge



Business 2.0 reports:

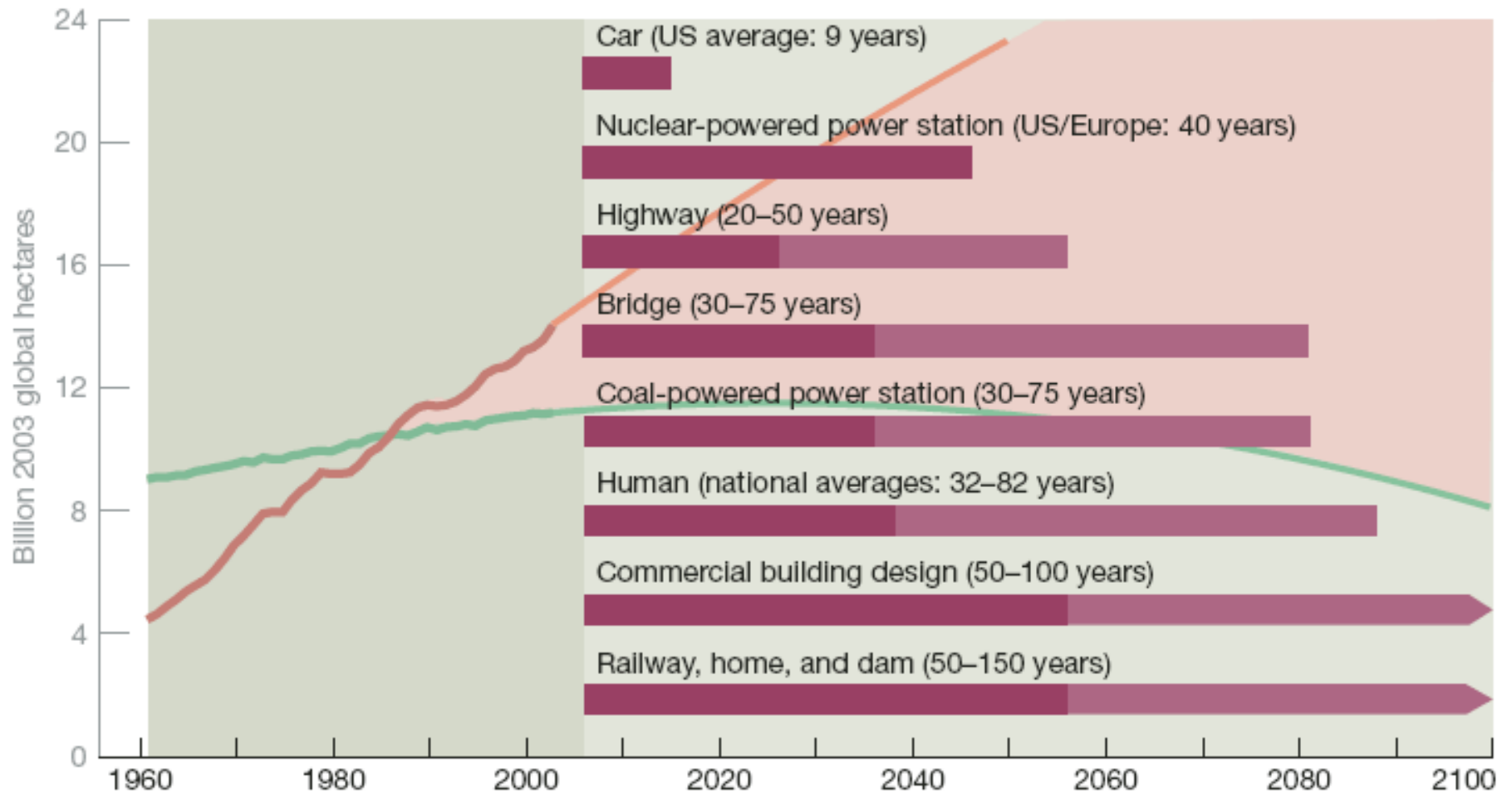
- 200 billion s.f. of new construction in the U.S.
- \$25 trillion development market by 2030

US Dept of Energy states:

- Building sector accounts for half of all CO₂ emissions in the U.S. annually
- Buildings consume more energy than any other sector of the U.S. economy, including transportation and industry

USA emits ¼ of all GHG emissions on our planet

Fig. 31: LIFESPANS OF PEOPLE, ASSETS, AND INFRASTRUCTURE



APRIL 3, 2006

www.time.com AOL Keyword: TIME

SPECIAL REPORT GLOBAL WARMING

TIME

BE WORRIED. BE **VERY** WORRIED.

Climate change isn't some vague future problem—it's already damaging the planet at an alarming pace. Here's how it affects you, your kids and their kids as well

EARTH AT THE TIPPING POINT
HOW IT THREATENS YOUR HEALTH
HOW CHINA & INDIA CAN HELP
SAVE THE WORLD—OR DESTROY IT
THE CLIMATE CRUSADERS



WATCH "RETURN TO YFIRIC" NATIONAL GEOGRAPHIC CHANNEL, JUNE 7, 8 PM, ET/PT

INSIDE THE WORLD OF IRAQ'S SHITES

NATIONALGEOGRAPHIC.COM/MAGAZINE

JUNE 2004

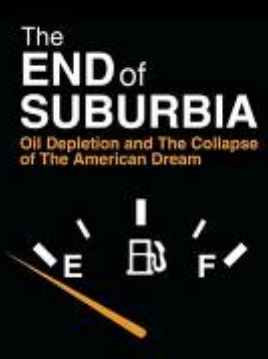
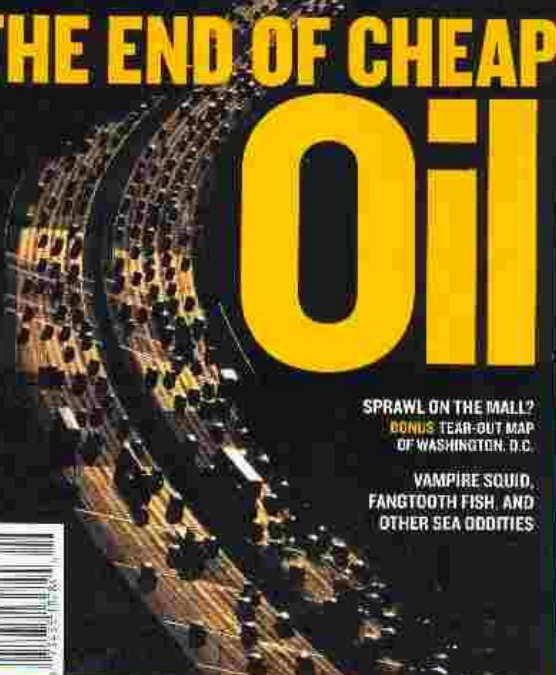
NATIONAL GEOGRAPHIC

THE END OF CHEAP

Oil

SPRAWL ON THE MALL?
BONUS TEAR-OUT MAP OF WASHINGTON, D.C.

VAMPIRE SQUID, FANGTOOTH FISH, AND OTHER SEA ODDITIES



VANITY FAIR

SPECIAL GREEN ISSUE

A THREAT GRAVER THAN TERRORISM: GLOBAL WARMING
How much of New York, Washington, and other American cities will be underwater?

GEORGE CLOONEY
JULIA ROBERTS
ROBERT F. KENNEDY JR., AND AL GORE
and the call for
A NEW AMERICAN REVOLUTION

PLUS
EXCLUSIVE BOOK EXCERPT!
THE BOSTON STRANGLER
MY MOTHER'S BRUSH WITH DEATH BY SEBASTIAN JUNGER

2ND-QTR SIZZLE PROFITS AT 900 COMPANIES (P. 74) **PAYING FOR COLLEGE BEWARE OF THOSE HIGH 529 FEES (P. 95)** **TERRORISM WHAT COMPANIES STILL NEED TO DO (P. 26)**

The McGraw-Hill Companies

BusinessWeek

www.businessweek.com

GLOBAL WARMING

Why Business Is Taking It So Seriously
BY JOHN CAREY (P. 60)

Entertainment WEEKLY

MR. GORE GOES TO HOLLYWOOD

The Inside Story of How the Ex-Vice President Became Summer's Most Unlikely Movie Star

TAYLOR HICKS
OSCAR & EMMY CONTROVERSIES
ROSARIO DAWSON
50 GREATEST POP CULTURE SIDEKICKS

THE CHINESE APPRENTICE | THE STORY OF B. SMITH | FROM BEYOND THE GLOBE WALKS

THE Atlantic

HOT PROSPECTS
WHO LOSES—AND WHO WINS—IN A WARMING WORLD
BY GREGG EASTEBROOK

WILLIAM H. GASS ON THE UNKNOWN CAEKA

HARPER'S

IMAGINE THERE'S NO OIL
Scenes from a Liberal Apocalypse
By Bryant Urstadt

BUSH'S GITMO WARNINGS | A BOOMER MUSIC QUIZ

NewWeek

The New Greening Of America
From Politics to Lifestyle, Why Saving The Environment Is Suddenly Hot

A PLAN FOR A BRIGHT FUTURE BEYOND 2050

SCIENTIFIC AMERICAN

SPECIAL ISSUE

The human race is at a unique turning point. Will we choose to create the best of all possible worlds?

Crossroads for Planet Earth

The Population Peak • Energy Solutions
The New Face of Disease • Water and Wealth
How to Save Species • Ending Poverty

LEED and Coal

- Coal power is a major issue for global sustainability
- LEED sets prerequisites for energy efficiency, but not the source of power

Poplar Point



ONE
PLANET
LIVING

TORTI GALLAS AND PARTNERS
Architects of Community

CLARK
REALTY CAPITAL



LEED isn't enough

A LEED version of DC site Poplar Point (9m s.f.) would emit **140,000 tons of CO2** each year by drawing energy from PEPCO's coal-fired energy infrastructure.



Absorbing CO₂

Home Depot is funding the planting of 300,000 trees in cities across the US to help absorb carbon dioxide (CO₂) emissions...

33.6 million trees – a forest almost 50% larger than the entire District of Columbia.

Southwest Waterfront

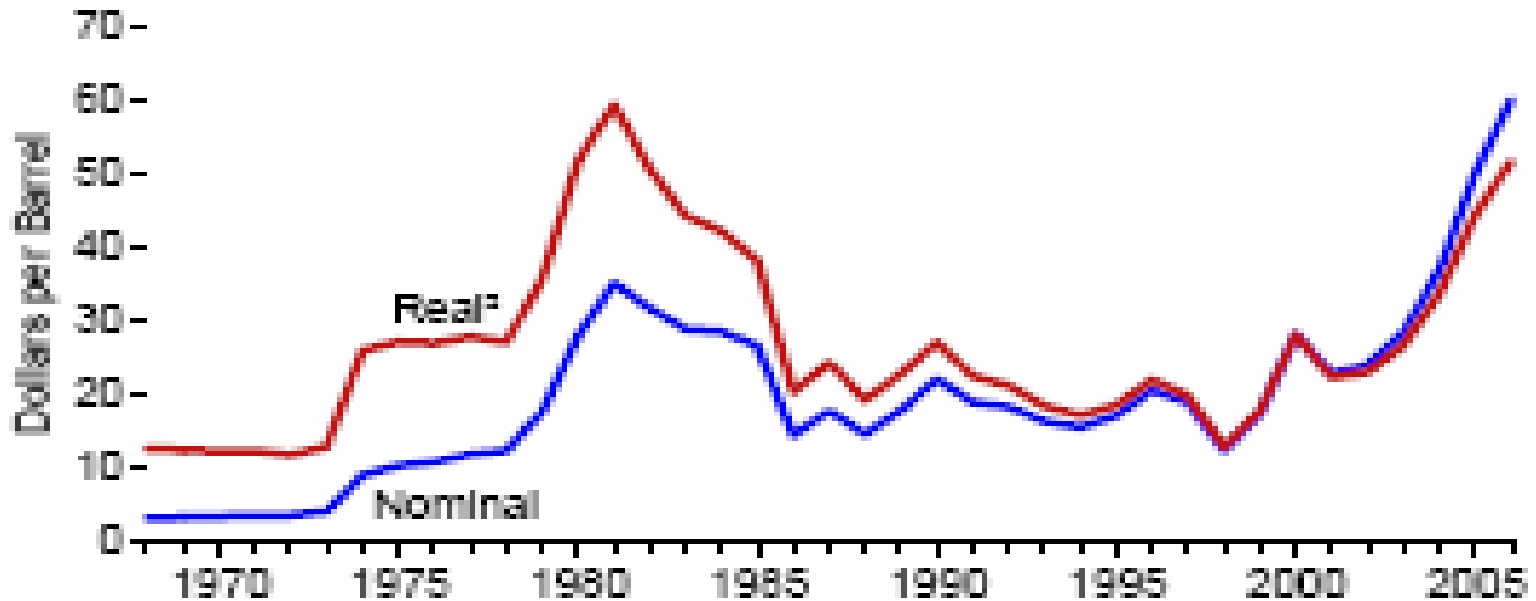




1 Zero Carbon

Escalating Fuel Costs

Figure 20. Crude Oil Refiner Acquisition Cost*



* Composite of domestic and imported crude oil. ² In chained (2000) dollars, calculated by using gross domestic product implicit price deflator. See "Chained Dollars" in Glossary.



BANKER OVERLOOK

MAIN AVENUE

FISH MARKET

CITY SQUARE

WHARF STREET

WASHINGTON CHANNEL





GREENSCREEN - 07988 25000

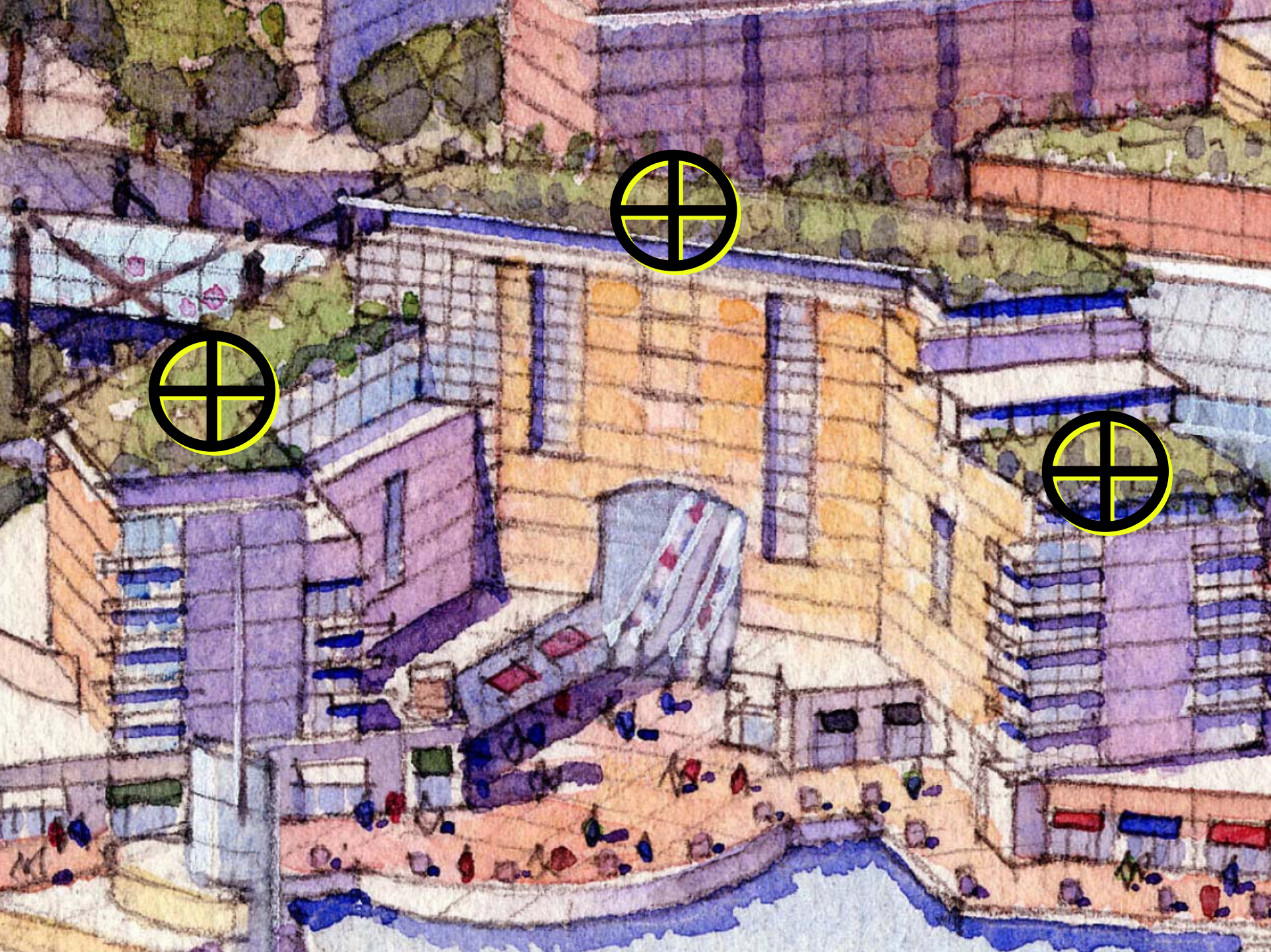
- Market-tested:
 - 1400 installations in the UK of CHP
 - Globally, biomass power capacity at 44 GW in 2005
- Biomass is the US' single largest source of non-hydro renewable electricity
- Bay Area creates roughly **2,397,600** dry tons/yr of urban wood – most of it **will be sent to landfill**

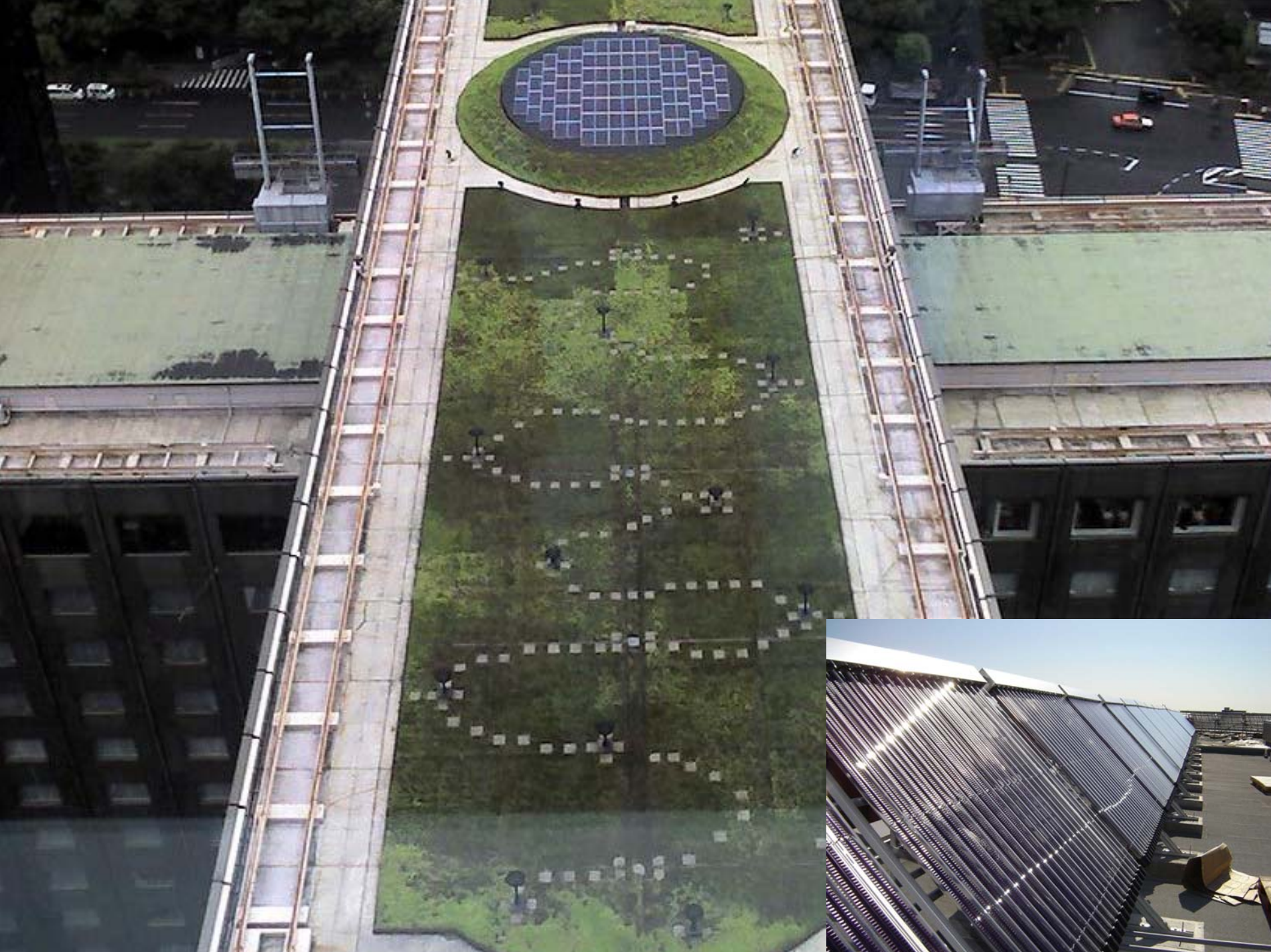


- CHP serving 30.7m s.f. in St.Paul since 2003
 - 80% of downtown St. Paul
- 25 MW of electricity, 65 MW of thermal energy
- The plant reduces greenhouse gas emissions by more than 280,000 tons
- Each year, 300,000 tons of wood waste from a recycling center is converted into biomass fuel for the Saint Paul co-generation facility



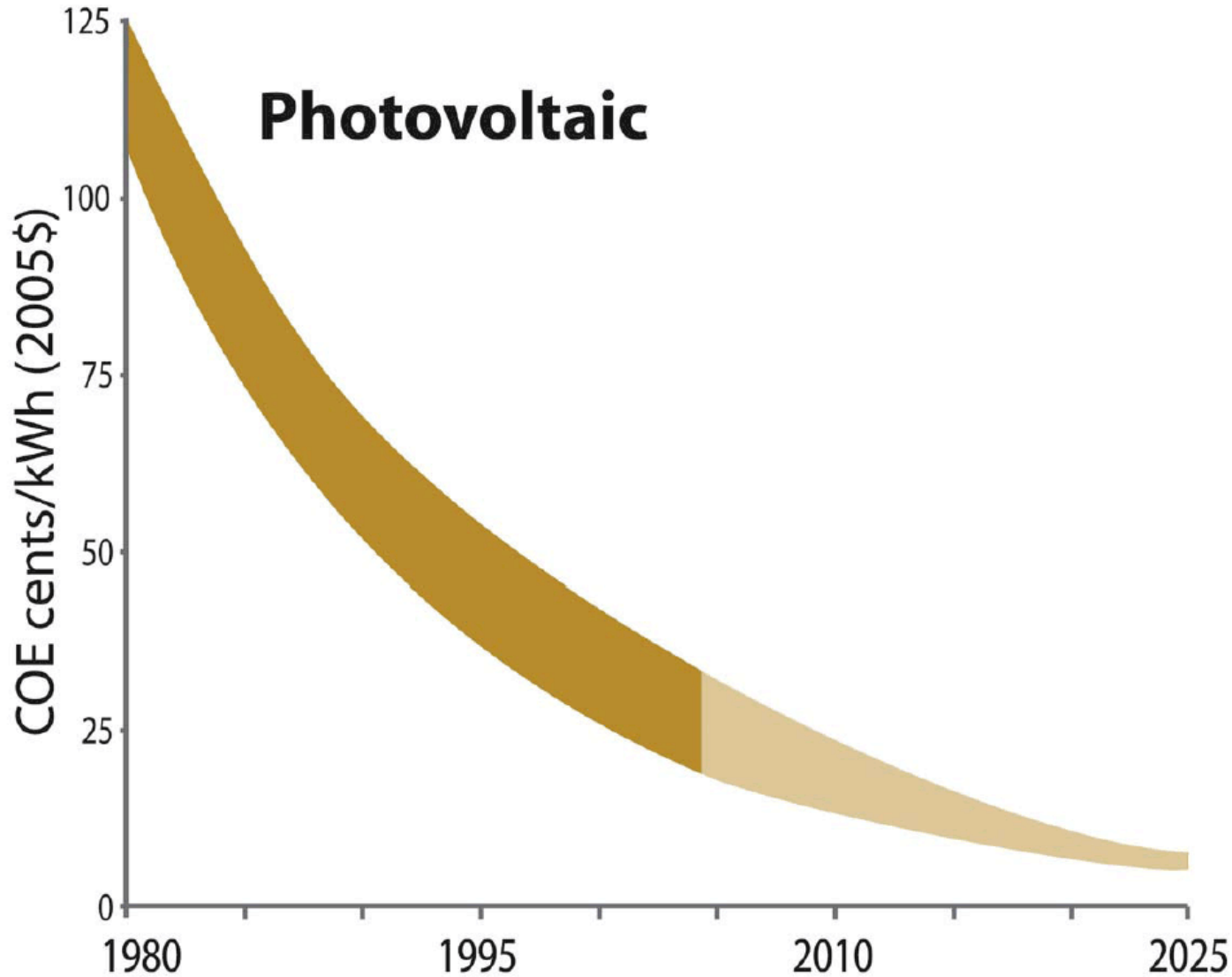
 
DISTRICT ENERGY DISTRICT COOLING
St. Paul, Inc. St. Paul, Inc.



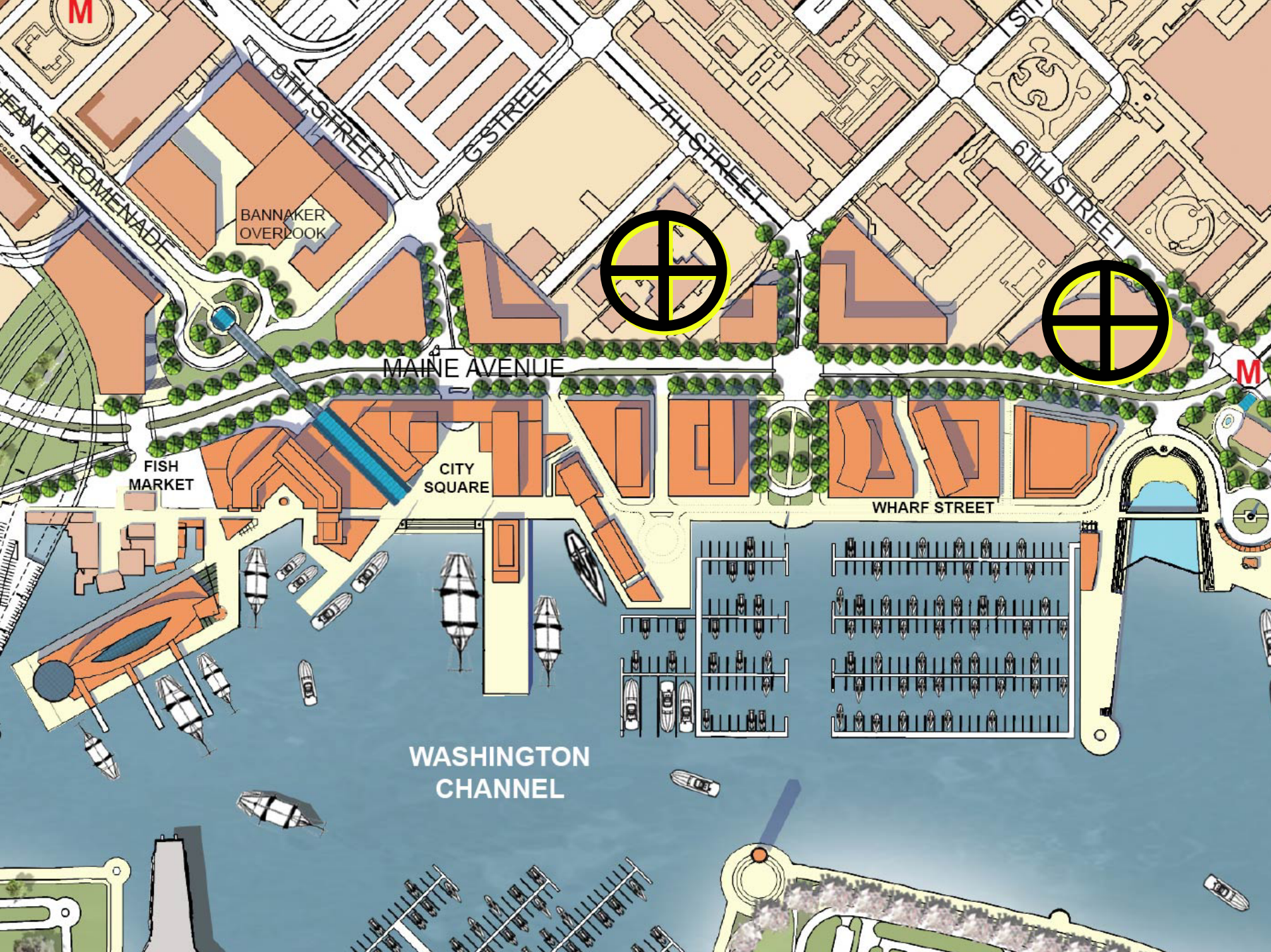


Solar Energy Cost Trends

Levelized cost of energy in constant 2005\$¹







BANKER OVERLOOK

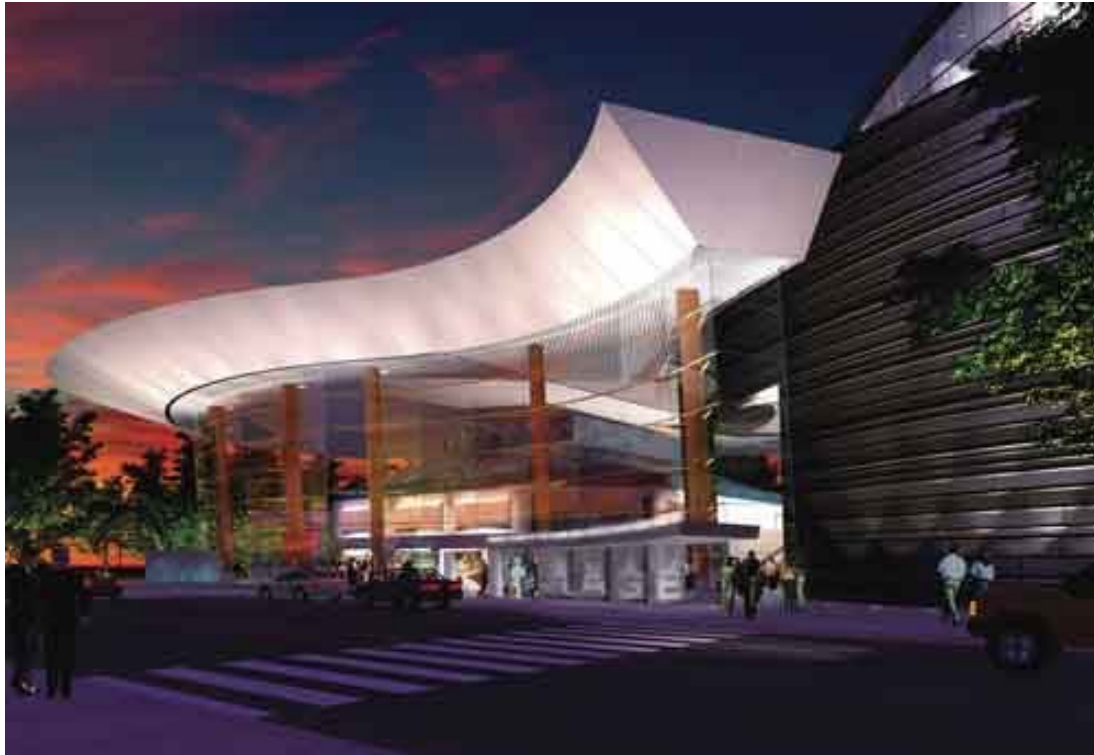
MAINE AVENUE

FISH MARKET

CITY SQUARE

WHARF STREET

WASHINGTON CHANNEL

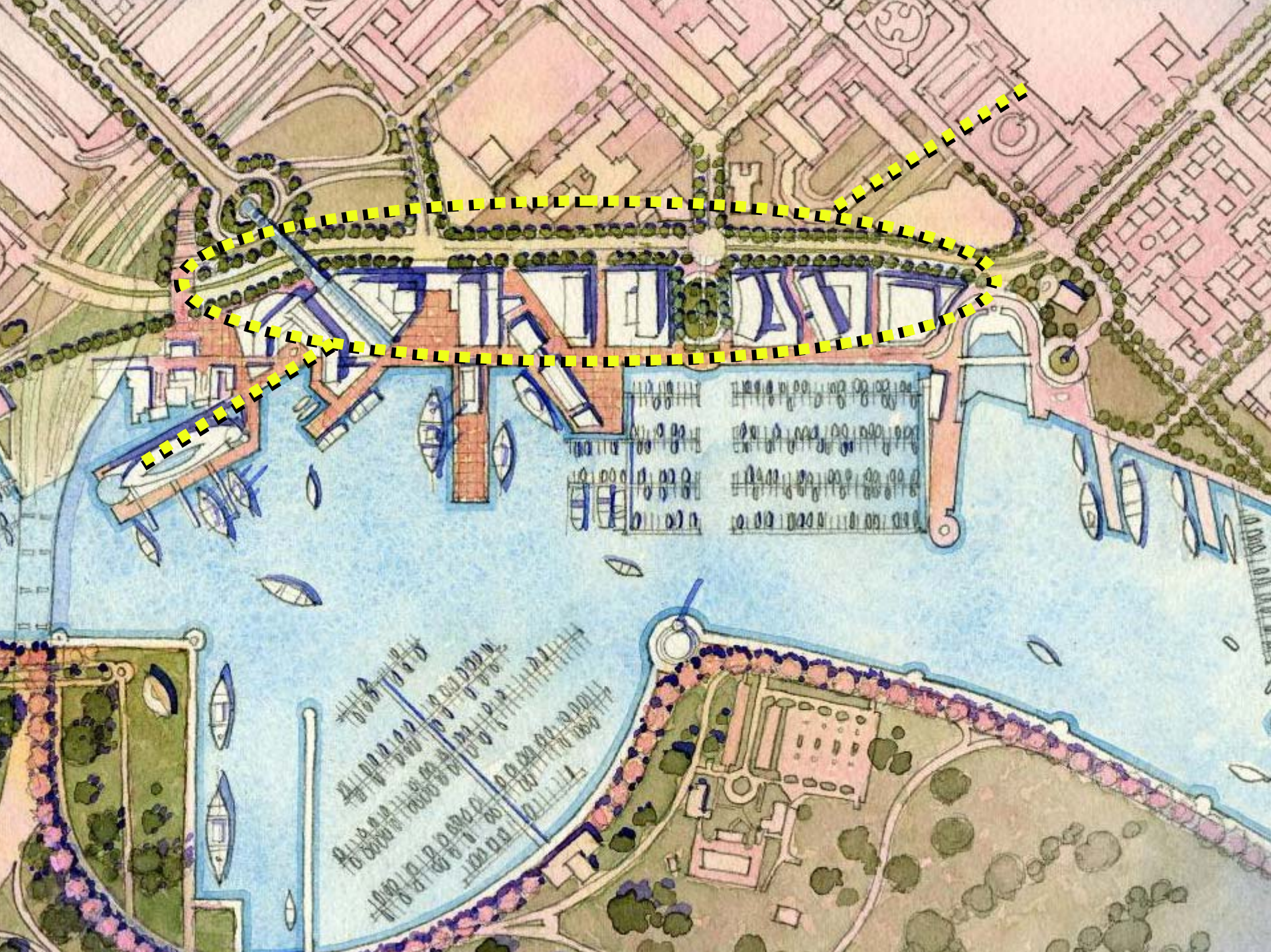




**ONE
PLANET
SCHOOL**

retrofit me.









1 Zero Carbon

Targets:

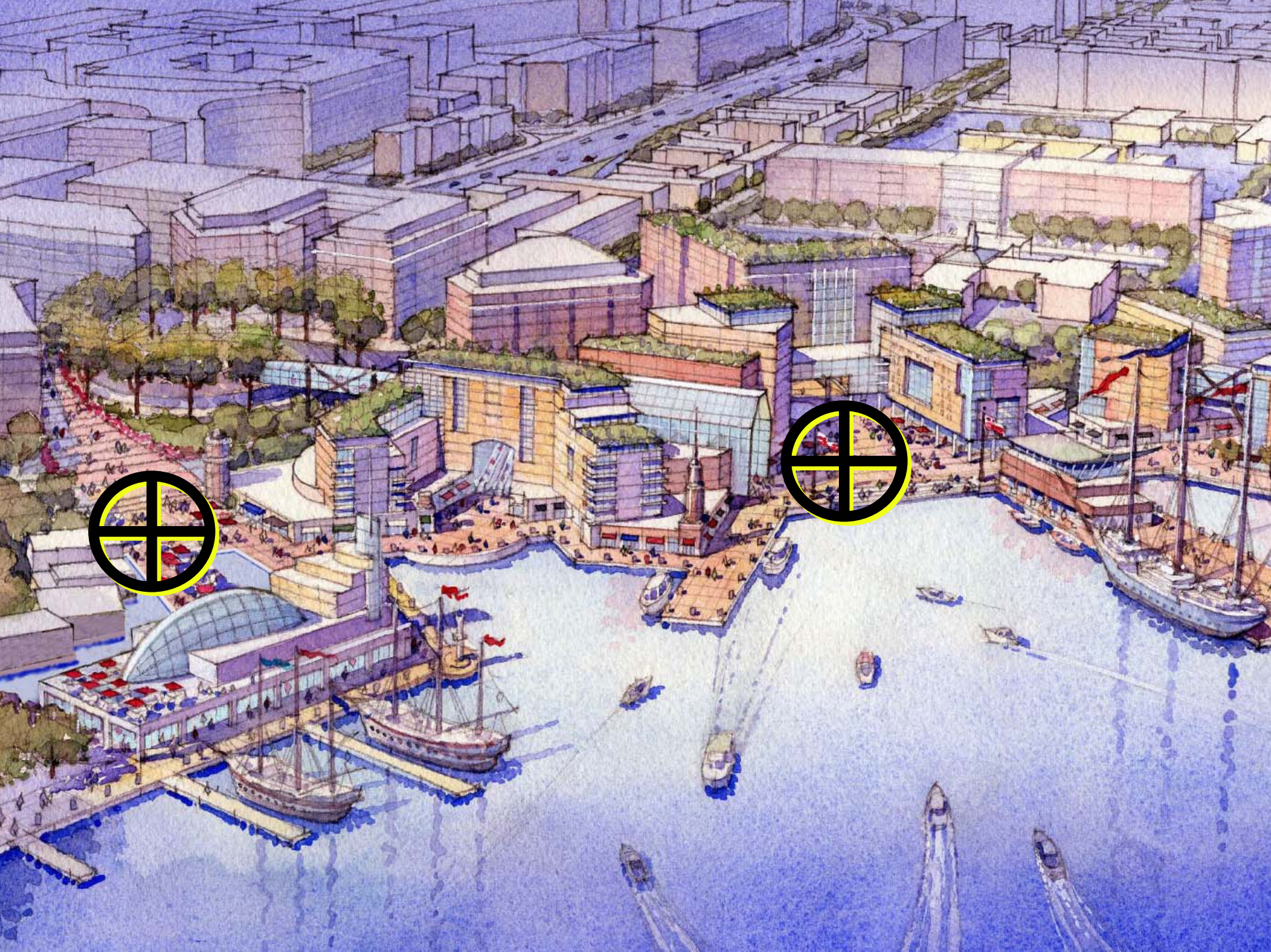
- 2020: cutting 4.5 tons of of CO₂ emissions in buildings per person per year
- 100% reduction from national average: 0.0 Tons of CO₂ Emitted Per Person Per Year in Buildings

Strategies:

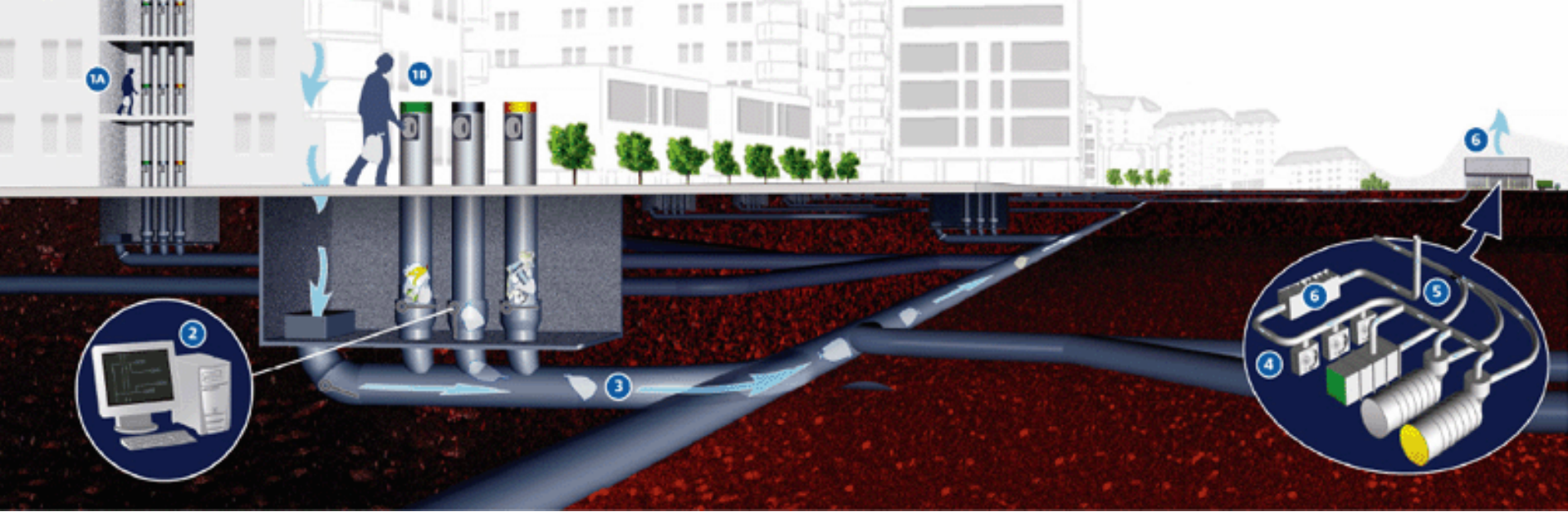
- High-efficiency design
- Bio-deisel fuel cells? Biomass boilers?
- Solar



2 Zero Waste







2 Zero Waste

Targets:

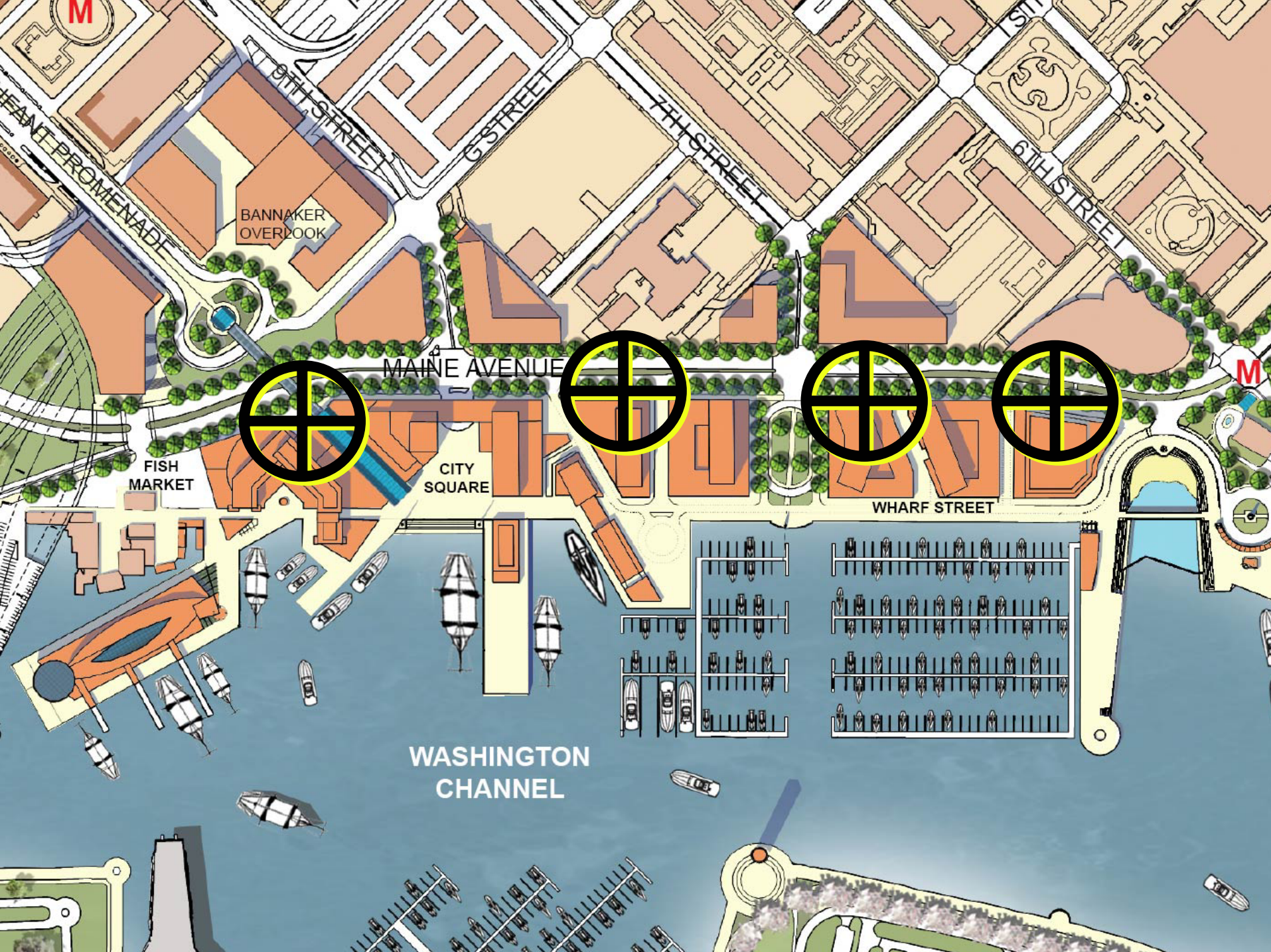
- **2020:** No more than 2% of waste by weight should be sent to landfill (down from 45%)

Sample Strategies:

- Work with Sonoma County Waste Management to create an innovative program in which
 - garbage prices are set to encourage minimized volume
 - recycling is made inexpensive or possibly free
 - food waste is collected & composted
 - easy method for properly disposing of hazardous/toxic materials
- Create a plan for generating a culture of Zero Waste. Incentives, contests, kids education and reporting.



3 Sustainable Transport



BANNAKER OVERLOOK

HEAVY PROMENADE

MAINE AVENUE

FISH MARKET

CITY SQUARE

WHARF STREET

WASHINGTON CHANNEL





3 Sustainable Transport

Targets:

- 2020: cutting 4.5 tons of transportation CO₂ per person p.a. down to 1 ton

Sample Strategies:

- Car share on-site & social marketing
- Plug-in hybrids sold with houses; Vehicle-to-Grid program
- Alternative fuel commuter shuttle
- Cycle strategy/path



4 Local and Sustainable Materials

- 50%+ of materials recycled or reclaimed
- 90% reduction of toxic materials
- 30% reduction of embodied carbon
- ECO-Block: Low-energy pre-fabricated polystyrene building block





4 Local and Sustainable Materials

Targets:

- **2012:** 60% manufactured within 500 miles
- **2012:** 35% manufactured within 50 miles
- **2012:** 20% manufactured on-site

Sample Strategies:

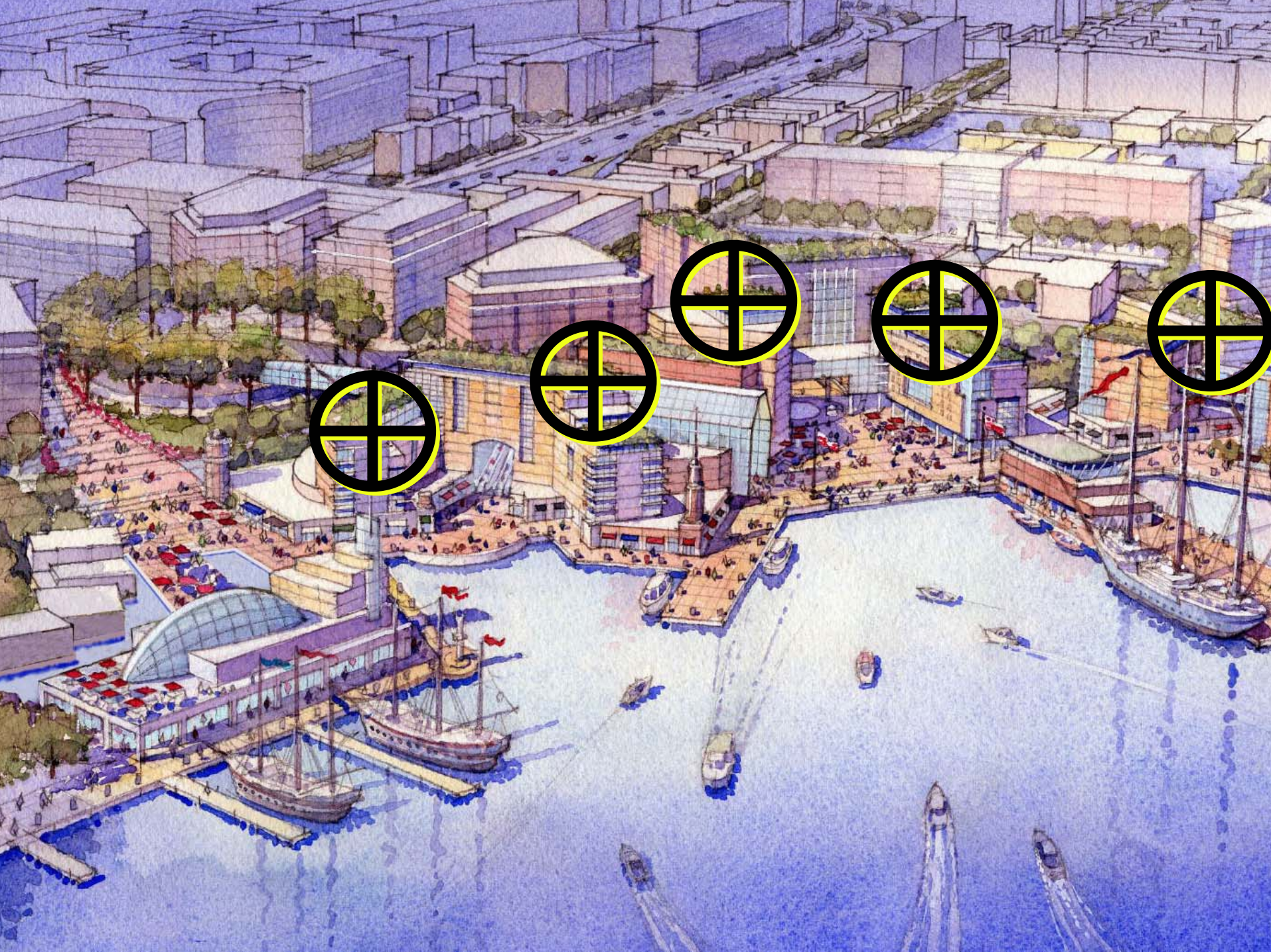
- Steel frame construction
 - On site manufacturing facility
 - Green-collar, local jobs
 - Recycled content (8 recycled cars or 40 trees)
 - Solar powered



5 Local and Sustainable Food











5 Local and Sustainable Food

Targets:

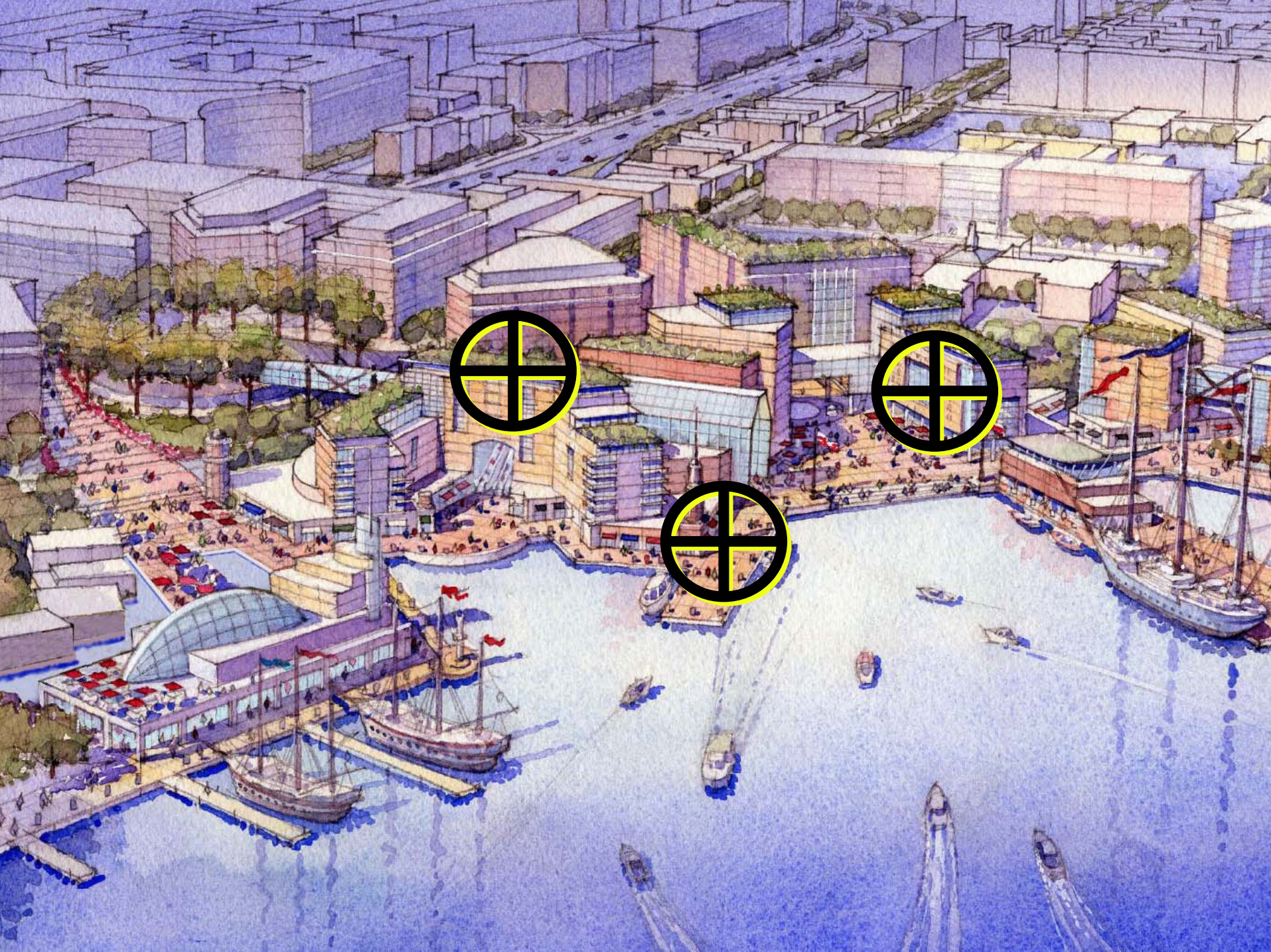
- 2015: 10% of all food consumed by residents is organic or fair trade by 2015
- 2020: 65% of food consumed on-site from within 300 miles and 25% from within 50 miles

Sample Strategies:

- Onsite 50,000 s.f. grocery store (2008) will source 25% of vegetables, fruits, dairy products and meats from within 50 miles and 75% from within 300 miles.
- 6+ community gardens; micro-farm



6 Sustainable Water





6 Sustainable Water

Targets:

- 2020: 60% reduction in drinking water consumption (savings: 144 gallons per unit per day)

Sample Strategies:

- Onsite sewage treatment
- Rainwater harvesting for toilet flushing and irrigation
- Water efficiency standards: toilets at 1.0 gpf, 0.5 gpf urinals or less, commercial lavs at 0.5 gpm, showerheads at 1.5 gpm, dishwashers, clothes washers, CIMIS-controlled efficient irrigation (bubblers, drip, sub-surface, micro-spray, etc).



7 Natural Habitats and Wildlife





7 Natural Habitats and Wildlife

Targets:

- 10% of the project site will be restored to protected native habitat
- Buy and protect off-site conservation land that is equal to or larger than 50% of the area of the project (90+ acres)
- Full biological assessment of site, 10-year management plan for on-site native habitats and their buffers and establish a guaranteed funding source for management
- Promote backyard wildlife habitat
- Apiaries, butterfly gardens, bird & bat boxes, raptor roosts
- Reduce light pollution

7 Natural Habitats and Wildlife



Land: Densified land use model enables incredible biodiversity regeneration

7 Natural Habitats and Wildlife



- €152 million for replanting 11,900 acres
- Wetlands, coastal restoration
- Lynx conservation “tax”











LynxBrief

lynxbrief@yahoo.co.uk



Welcome to the fifth edition of *LynxBrief*, a briefing paper focusing on the conservation of the Iberian Lynx, the most endangered big cat species in the world. Comments on, and queries about, any issue relating to the conservation of the Iberian Lynx should be emailed to: lynxbrief@yahoo.co.uk

Contents

The importance of sending lobby letters	1
Habitat planning for the Iberian Lynx	1
Expanding Andújar Natural Park	2
Update on the captive breeding programme	2
Update on new lynx LIFE proposal	3

The importance of Lobby Letters

Each edition of *LynxBrief* has recommended that lobby letters be sent to politicians and policymakers to support or oppose particular actions that influence lynx conservation and the survival of the species. In addition, a number of model lobby letters have been made available (under the banner "model lobby letters") on the SOS lynx website: www.soslynx.org

It is very important that individuals and representatives of scientific institutions, NGOs and Government organisations, send lobby letters. If lobby letters are not sent then politicians and policymakers do not know the strength of feeling that exists about a particular issue. This is particularly important to counterbalance lobbying from conflicting interests, e.g. for development in lynx areas. Letters can be one of the most effective ways of making politicians and policymakers change their actions, including with respect to nature conservation.

Model letters are provided, along with the information included in *LynxBrief*, to make it even easier to write and send lobby letters. Where possible, email addresses are also provided. If model letters are used, they should be modified to make them more personal to the sender and/or the organisation that they represent. This helps to give each letter more influence.

Thank you for making a difference to lynx conservation!



©Antonio Sabater

Stop Press: LA TEST KNOWN LYNX DEATHS

The body of a dead lynx killed by road traffic at Huelgas, near El Rocio (Duhama), and the body of another lynx killed by unknown causes in a hunting estate were both discovered in early September.

www.lynxbrief@yahoo.co.uk

August 2005

1

New Iberian Lynx Compendium!

The IUCN Cat Specialist Group has produced a new online compendium of information relating to the Iberian Lynx (e.g. academic publications, reports, maps, plans etc.). This very useful compendium is now publicly available under the banner "conservative compendia" at: www.catsg.org



Habitat Planning for the Iberian Lynx

Work is now underway to plan areas of habitat available and important for a viable recovered Iberian Lynx meta-population in the future. This work will include mapping geographical information about habitat quality, along with consideration of prey (i.e. rabbit) availability and negative pressures from local human populations (e.g. hunting and land-use change).

Habitat planning for the Iberian Lynx is essential for:

1. Identifying and preparing areas for future reintroductions and translocations of lynx, as recommended by IUCN guidelines.
2. Justifying protecting areas of habitat important for future lynx recovery, which may not currently contain any lynx, particularly in the face of strong and conflicting pressures for damaging development.

Given that the lynx is an Iberian species, habitat planning will involve collaboration between various Spanish Autonomous Regions and Portugal. This inter-regional work was encouraged particularly by a presentation from the IUCN Cat Specialist Group at the Iberian Lynx Conference in Córdoba, December 2004 - which itself drew upon experience with planning habitat for the recovery of other feline species. Subsequently, a habitat planning workshop was held in Portugal in March 2005, attended by representatives from Spanish Autonomous Regions and the Portuguese government, organised by Pedro Sarmiento.

The planning of habitat for the Iberian Lynx is being co-ordinated by José García Santiago (Junta de Andalucía) and Fridolin Zimmermann (IUCN Cat Specialist Group). To date, important information has been provided by the Junta de Andalucía, as well as from the Portuguese Government and the Junta de Extremadura. Unfortunately, however, useful information has not yet been provided by the regional governments of Castilla-La Mancha, Castilla y León and Madrid, and habitat planning is thus behind schedule.

In order to allow habitat planning to proceed, it is essential that required geographical information is provided as soon as possible from Castilla-La Mancha, Castilla y León and Madrid. Without this information, the planning of future reintroductions and translocations will not be possible, and it will be harder to justify protecting particularly important areas of habitat.

In order to inquire about, or submit information for, habitat planning, please contact:

José García Santiago - jgsantiago@junta.es
Fridolin Zimmermann - fzimmermann@iucn.org

Support for Iberian Lynx conservation



Europe's most endangered big cat



8 Culture and Heritage



America's Premiere Urban Ecotourism Destination



URBAN



HQ



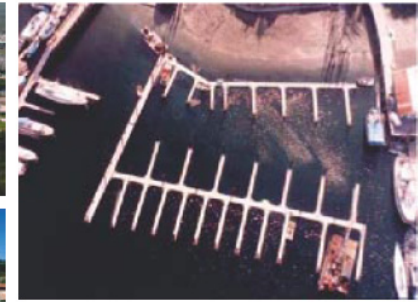


Exhibition Center



Show Home

- Cable Tow for Wakeboarding
- White Water River
- Standing and Surf Waves
- Mountain Bike Trail
- Free-Ride Bike/Skate Park





9 Equity and Fair Trade

Targets:

- 1.0 jobs available on site for every new unit of housing sold; at least half continue beyond 2020.
- Exceed the City's requirements for affordable housing by providing an additional 10% of units affordable by design and without deed restriction.
- 2010: Launch a 'Think Local' campaign to encourage people to spend locally
- Recruit 5+ retail businesses which agree to sell fair trade goods other than coffee and chocolate.
- Ensure minimum of 90% of jobs on site meet the County living wage standard.
- Incubate, create and attract local businesses to achieve 75% jobs/housing balance as measured by a commute of less than 20 miles by 2020.
- Open a One Planet® Living Center on site by 2012, and work with OPL to jointly find funding sources to build out and staff the facility.

9 Equity and Fair Trade

- 11,000 local jobs
- An accreditation system ensures that most products and services are locally sourced, and that they meet standards of high quality and environmental sustainability .



10 Health and Happiness

Targets:

- Annual survey of resident's health & happiness

Sample Strategies:

- Wellness infrastructure: soccer field, bike paths, par course, health center, affordable family-friendly gym, yoga, martial arts studios, wellness center, health clinic
- Create comfortable places for teenagers.
- Establish an informal component to the community center with a central common space to encourage chance encounters with the various groups that use the center.
- On-site horseback riding



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SONOMA MOUNTAIN
VILLAGE

BioRegional



Towards Zero Carbon

Political Climate in America

- **Trends – first in Europe – then California – then North America**
- **changing legislation – UK – carbon neutral houses by 2016**
- **Kyoto – or cap and trade?**

Consumer Expectations

- **Comfort**
- **Daylighting**
- **Health**
- **“Green” is standard – what is differentiator in a buyer’s market?**



Home Depot is funding the planting of 300,000 trees in cities across the US to help absorb carbon dioxide (CO₂) emissions...

The CO₂ emissions from only one medium-sized (500 MW) coal-fired power plant, in just 10 days of operation, will negate this entire effort.

*this is about 500 acres of new forest – enough to sequester 1,250 tons of carbon



Wal-Mart is investing a half billion dollars to reduce the energy consumption and CO2 emissions of their existing buildings by 20% over the next seven years. If every Wal-Mart met this target...

The CO2 emissions from only one medium-sized coal-fired power plant, in just one month of operation each year, would negate this entire effort.

- California passed legislation to cut CO₂ emissions in new cars by 25% and in SUVs by 18%, starting in 2009.

If every car and SUV sold in California in 2009 met this standard...

The CO₂ emissions from only one medium-sized coal-fired power plant, in just eight months of operation each year, would negate this entire effort.

Southwest Waterfront Energy use

- Average Price of Electricity PEPCO:
9.88c / kWh (12.5c for wind)
- 23.8% increase in cost from 2002 – 2006
after deregulation
- 84% Coal, 14% Oil, 3% NG, 1%
renewables
- 2.2 lbs / kWh for Coal generation in US
(DOE)



Power loads and Strategy

Annual Residential Heating and Cooling Loads (20.2 kWh / sq ft)

- Cooling: 1.2 kWh / sq ft
- Heating: 10.2 kWh / sq ft
- Hot Water: 3.4 kWh / sq ft

Annual Commercial Heating and Cooling Loads (16.6 kWh / sq ft)

- Cooling: 2.3 kWh / sq ft
- Heating: 3.1 kWh / sq ft
- Lighting + equipment: 6.8 kWh / sq ft

Strategy to achieve zero-carbon

- Energy consumption reduction: efficiency, geothermal
- Geothermal and Solar Thermal - payback
- Offsite generation: ESCOs, PEPCO Credits
- On site generation: solar, wind, biomass

- Total Site Energy Load: 38.8 GWh / yr
 - 38,800 tonnes / yr CO₂eq
 - 80,000 acres of forest each year
- Appliances: 20% reduction
- Lighting: 60% reduction
- Envelope: 40% of heating
- Low-flow hot water use: 30% reduction
- After efficiency: 20-25 GWh / yr (40%)
 - Very minimal costs: mostly design premium

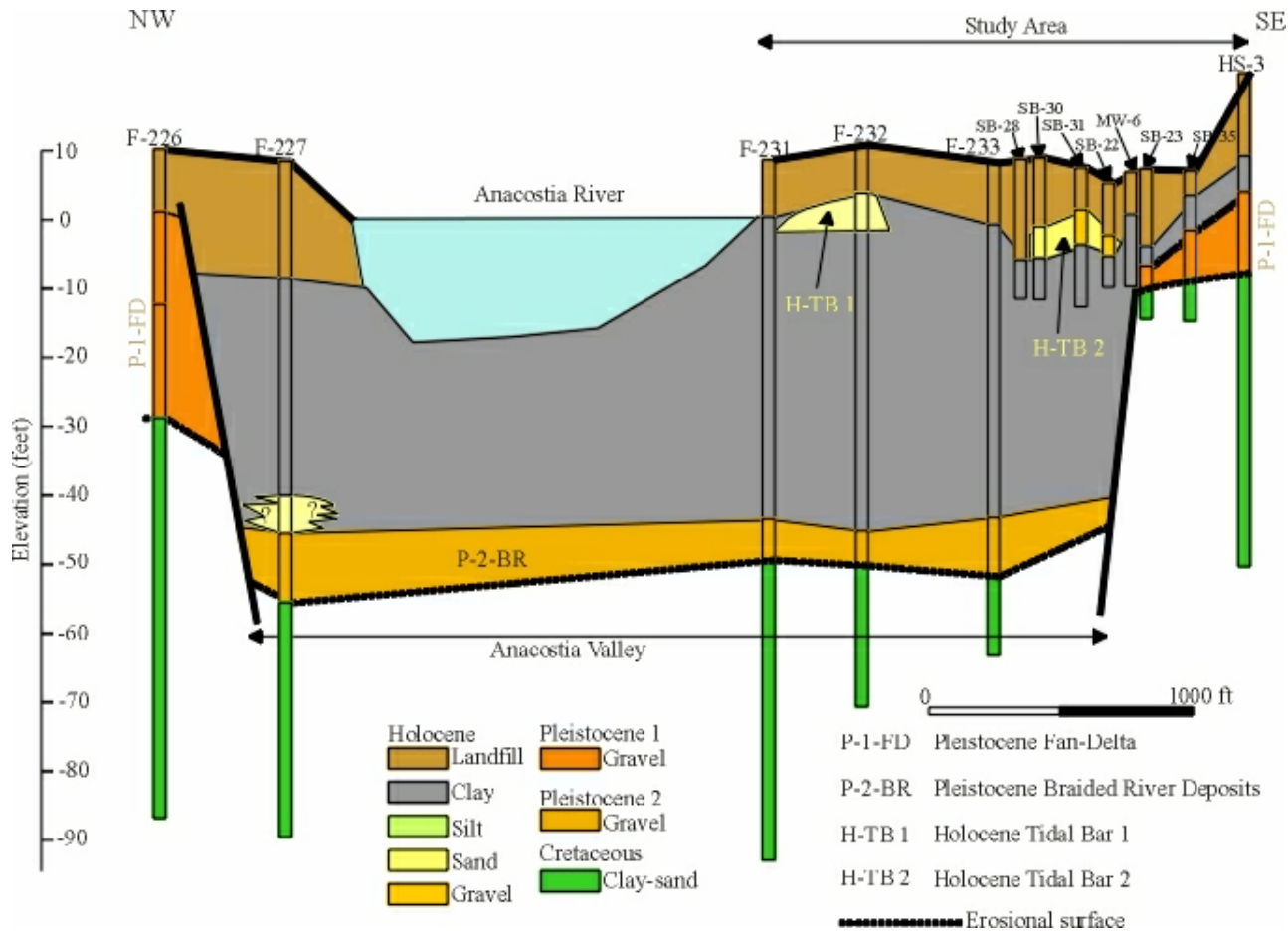


Geothermal - Heat pumps

- Closed Loop system for commercial and residential buildings
- Design load at 20% of peak heating and cooling loads
- Net Heating: 1900 MWh (65% reduction)
- Net Cooling: 2800 MWh (45% reduction)
- Estimated cost: 7-9 c / kWh
- Simple payback period: 8-10 years
- Total investment: \$3.0 - \$5.0 M
- Ideal case: 5-7 yr SPP, 4c - 6c per kWh
- District heating and cooling: energy exchanges



Lower Potomac Group confined aquifer



Solar thermal

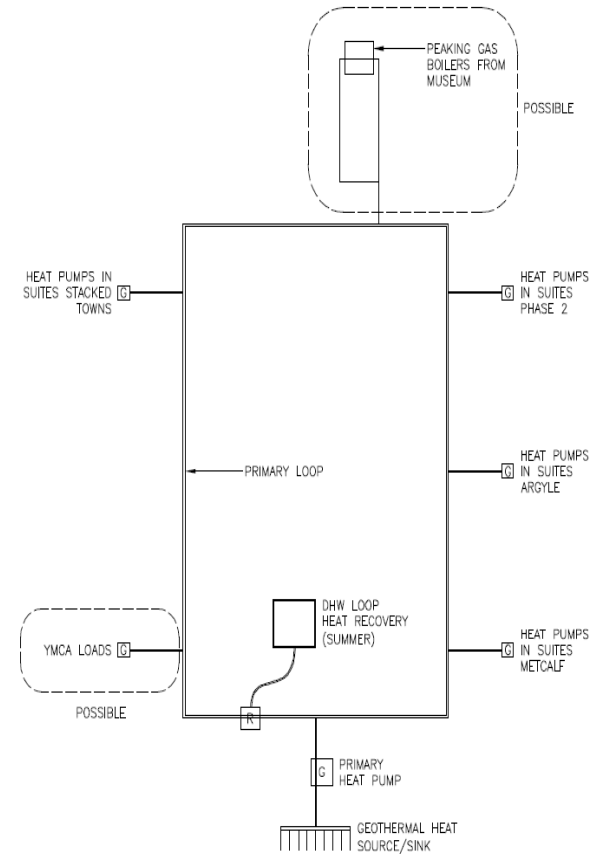
- Evacuated tube solar panels on residential buildings:
400 collectors x 16 tubes
- 830 MWh / yr (45%)
- Total Cost: \$1.3M
- Simple payback period 10-12 years
- Cost per kWh: 7-10c / kWh



-
- *Ultimate need: 10-15 GWh (60% - 80% efficient)*

Off-site and alternatives

- Offsite production
 - Wind plants through local ESCO and agreement with PEPCO
6-8 MW facility could provide 17 GWh / yr
 - Precedents:
 - Community Energy, Inc. Bear Creek (Pa): 12 turbines 24 MW estimates (0.5 to 1.8 c / kWh premium)
 - Washington's 332-room Willard InterContinental:
100 percent wind renewable energy credits
 - Montgomery County: 1.5 c incentive package
 - 11% Tier 1 renewables by 2022
- District Heating/Cooling/DHW
 - Match heating-cooling needs
 - Reduce engineering and management costs



On site generation

Solar PV + Wind

- Distributed source (rooftop panels)
- 1st generation simple silicon n-p diode
- Total panel area required to meet all energy needs:
 - available space if all buildings were 3-4 storey
- **Solar PV cost: 29 c per kWh**
- Average wind speed: 3.8 m/s
- **Wind cost = 36c per kWh (4 MW Facility)**

Notes

- Bush Administration has targeted grid parity for solar by 2015 across USA - Hawaii 29 c per kWh
- Net Metering available since 2005 with PEPCO (100 kW)
- Wind - Solar complimentary generation profiles



8 Culture and Heritage

- Neighborhood rewards program
- Hosting one local festival each month
- Farmer's market at least once per week after people begin living on site.
- Community extranet to provide significant and accessible information on local culture and heritage, places to visit and so on
- Cultural influences in architecture & design



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