

In 2008, cities have become the places where most humans live; so, no doubt both our major development problems and solutions –read *innovations* - lie there. From *phalansteres* to eco-towns, sustainability has always been part of the urban utopia i.e. 'creating a harmonious society, based on harmonious relationships with nature'. But changes are speeding up the *retour à la réalité* in the turmoil accompanying the global crisis; cities are becoming the locus of social

experimentation of last resort. Three dreams are vanishing.

1. 'Costlessness': Responsibility to the distant poorer and to future generations has a price and technology-package solutions must be **affordable**, reason why democratic players that personify collective preferences are taking (costly) initiatives.

uses are embedded in urban land and buildings, **organisational innovations** in urban planning are pivotal.

3. *Electrification* (still) is part of the solution: production and distribution have to be re-examined in light of renewed uses; **quantum leaps in man-machine interfaces** must be made, and so must be the accompanying **business models**.

Key drivers

Matching stakeholders' shifts

by Pierre Bizard and Alain Quévrevu, September 2009

GREEN VARIANTS TOWARDS AFFORDABILITY

- (Sometimes coordinated) Transnational, regional and municipal policies are supporting innovation through:
 - [Lithium-x-battery] manufacturers -and automakers that chose them- to make [electric passenger cars affordable]
 - Environment-friendly urban energy system that [recycles residential and industrial waste], as well as [reuses rainwater], buildings equipped with air-conditioning and heating mechanisms powered by [solar panels and wind turbines]
 - Players – mainly [private – invest] in brand new small & medium size [eco-cities] through [public competitive tenders]
- In the meantime, incumbents opt for [(fuel) efficiency] oriented investments in tar sand, coal to liquid and carbon capture and storage, with impacts on urban management of carbon wastes

ACCOUNTING FOR THE BUILT ENVIRONMENT

- Growing [urban sprawl] and more [metropolises] lead to shifting urban land uses through sustainable building practices such as [transit-oriented development] [live-work district] and innovative [density of service provisions]
 - Emerging [city-use conflicts] to be solved through public consultations using [multi-criteria techniques] and [Life Cycle Analyses]
 - Location still matters and drives the [composition of the built environment] as regards [building materials] and [buildings' and city's organisation]; e.g., while bricks and wood show particularly low embodied energy, their adoption varies from place to place
- Designing [multimodal transport] for a safe, quick, comfortable, reliable and sustainable mobility for citizens
- [Sustainable ICTs] needed for [e-vehicles]: embedded and networked monitoring and control systems
- [Urban electrification revisited]: public-private investments in street-based network of car-charging and battery-swapping stations using robots to exchange empty batteries for charged ones in seconds
- Considering [China as a role model]: China willing to take up the global challenge of building oil-free cities employing 'the best tools and practices' from around the world and then sharing the experience with other countries

e-MOBILITY TECHS AND THE CITY

IDEAS FOR CHANGING EUROPE

A RESEARCHER'S THINKING

Fighting air pollution needs a sustained effort. If Kolkata banned all 15-year old commercial vehicles from the city streets, this is just a first-gen strategy. Even in Delhi after old vehicles were banned and CNG introduced, pollution levels are rising once again after a few easy years.

CSE has built a case for fiscal measures to curb pollution. West Bengal, for instance, has asked bus and car owners to shell out higher registration taxes from 30 Euros to 115 Euros, depending on engine capacity.

State governments including West Bengal, should buy the best-quality vehicle. However, local bus owners and green activists feel Euro IV may not be a great idea, given the paucity of fuel for Euro IV vehicles.

Anumita Roychowdhury, Delhi-based Centre for Science & Environment (CSE) associate director.

GRIPS Intelligence Corner

EU's 'smart-cities', UK's eco-towns', Korean 'innovative cities'...and Masdar

• **Sustainable city concepts** are flourishing lately. Beyond concepts, immense hope for the various high-tech public-private partnerships. Policymakers' boldness is key to allow the innovative packages to make a change in citizens' lives.

• **Masdar City**, the ultimate sustainable city showcase 'zero waste /zero carbon/ entirely powered by renewable energy sources' is being constructed. A € 15 billion government initiative, due to be completed by 2016 when it will accommodate 1,500 businesses and 50,000 residents. So far, the first Middle-East 10 MW solar park is connected to 30km for Abu Dhabi's electrical grid; it will supply Masdar with 17,500 MWh/year thanks to its 87,000 photovoltaic panels (half thin-film variety by US company, half crystalline panels by Chinese company).

A BUSINESSMAN'S INTEREST

Cornwall's current average water consumption is about 160 litres per person per day. We are working with South-West Water and Exeter University to devise water conservation and management measures so that the eco-town's average daily use is only 80 litres per person. The houses will be warmed and cooled using inter-seasonal thermal storage.

This relatively novel technology in the UK uses renewable electricity to drive heat pumps which cool buildings in the summer by transferring heat out of the building and, via heat exchangers, storing it underground. In the winter, the process is reversed and heat is transferred from the thermal store by the same pumps and exchangers, and pumped back to warm the buildings.

Ian Davies, Principal sustainability consultant for Imerys - about the Eco-Town in the Clay Country (Cornwall)

POLICY SUPPORT ON THE MOVE

BOSTON & MASSACHUSETTS SHIFTING FROM "WASTE MANAGEMENT" TO "SUSTAINABLE MATERIAL MANAGEMENT"

SOLID WASTE MANAGEMENT : URGENT ACTIONS NEEDED

Massachusetts' density of population is amongst the 5 largest of the US (Greater Boston alone has about 5.8 million inhabitants). In 2006, 6.6 million tons of waste in landfills and incinerators ("enough to fill a freight train more than 1,300 miles long") were disposed of, for a price of \$500 million. About 1.4 million tons of solid waste is disposed of out-of-state each year, with reduced capacity available at in-state landfills, exports are likely to rise in the future (between 2.5 and 4.1 million tons are expected annually by 2014).

Since 1988, the state has been striving to maintain enough waste management capacity to meet its own needs ("1990 Solid Waste Master Plan", updated in 2000, 2006 and on the verge of being so this very year). The 2006 Update aimed to reduce the solid waste by 70% and to recycle 56% of the solid waste generated by 2010. End 2008, Massachusetts recycled 47% of its waste: with still 10% to go, it will most likely not be met by 2010. Urgent actions are needed, among which revisiting ban on new incinerators (cf. the incinerator moratorium was established in 1990 to avoid overbuilding in-state disposal capacity).

BASIC ELEMENTS OF DEBATE: RECYCLING AND INCINERATING

Questions are now raised about the effectiveness of the moratorium: it has the unintended effect of protecting existing facilities from competition with new technologies. Indeed, relative price ratios are shifting.

On the one hand, the value of recycled material tends to augment; first, because the global demand for second-hand material has grown exponentially in recent years, especially from Asia and Europe; second, high energy and fuel costs have made virgin material and manufactured products more expensive. Also, recycling technologies are getting more mature. Improvements make it easier for cities to provide dependable streams of specific materials that can be used directly to make products. Waste bans now cover a variety of materials with well-established recycling markets. This move is supported by heavy state investments in recycling markets and infrastructure. On the other hand, even with increased fuel costs, the cost of out-of-state disposal remains very low compared to in-state disposal; inexpensive rail transport carries waste to out-of-state landfills with lower tipping fees.

The NEW FRAMEWORK shall therefore aim at expanding the degree to which materials are reduced, reused and recycled, which in turn would stimulate new markets and capturing the remaining value/ minimize the impact on environment of what cannot be reduced, reused or recycled.