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Gérard Magnin

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LOW ENERGY CITIES WITH A HIGH QUALITY OF LIFE FOR ALL

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How to combine Energy and Territorial Cohesion to meet the main challenges faced by cities

Gérard Magnin, Energy Cities Executive Director

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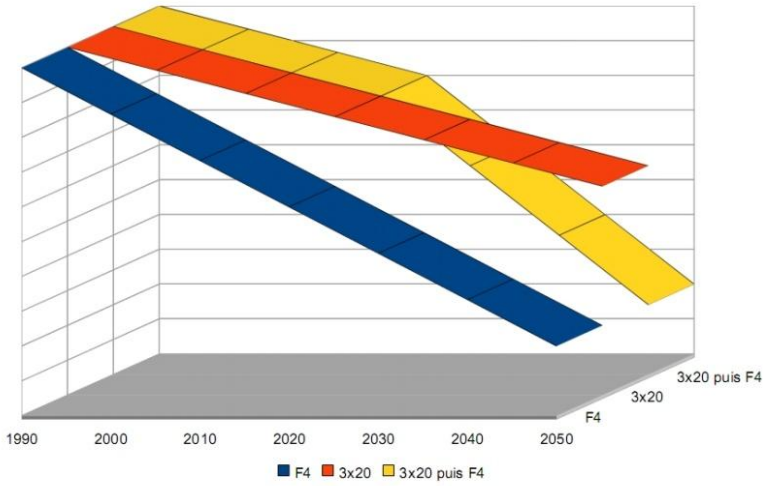
ABSTRACT

The concept of the low energy city with a high quality of life for all was first introduced in the IMAGINE initiative Memorandum[1]. At Energy Cities, we have adopted this concept to bridge the gap between two worlds that are still too often impervious to one another: Energy and Territories. The logic of the players from these two worlds is very different, to the point of making energy stakeholders ignore territorial issues and territorial policy makers ignore energy. Energy and climate constraints require us to rethink thoroughly our mode of development as well as our urban organisation. Sweeping changes with a far-reaching impact on our lifestyle will be necessary. 'Weak signals' are already visible and show the way forward. This article aims to help better understand these logics and identify ideas for progress.

[1] http://www.energy-cities.eu/IMG/pdf/IMAGINE_Memorandum_en-2.pdf

1. WHAT ARE OUR ENERGY AND CLIMATE PROSPECTS?

We are faced with energy and climate challenges that oblige us to simultaneously ponder short, medium and long-term considerations. All society players, regardless of their sector of activity, are concerned by this new exercise. Although there is a fairly strong consensus amongst the players when remote time horizons are involved (cf. "factor 4" – F4 – by 2050 for CO2 emissions), said consensus tends to weaken when shorter horizons supposedly geared to implementing factor 4, like the ''3x20'' by 2020, are considered and is virtually non-existent when it comes to establishing next year's budget. In fact, such overlapping time frames tend to lead to confusion.



For example, the "3x20'' by 2020 horizon is not aligned with that of "factor 4" by 2050[2] unless we consider that this means using the period prior to 2020 for reversing the trend and then giving it a sharper downward turn. In any case, such results cannot be obtained without changing our civilisation.

[2] The "3x20" trajectory (considering a 1990 baseline and, therefore, a 30-year period) actually leads to a *1.4* reduction factor by 2050 (30 years after 2020). This is why -40% by 2020 would be a more relevant objective (let us not forget that 2020 is midway between 1990 and 2050!). Converted into indices, this would give: 100 by 1990; 60 by 2020 (-40% base 1990) and 20 by 2030 (-80% base 1990 that is, -66% base 2020). In energy terms, factor 4 involves dividing energy use by 2 or 2.5.

2. HOW CAN THESE ENERGY PROSPECTS BE TRANSLATED AT TERRITORIAL LEVEL?

The "factor 4" by 2050 city will of course be quite different from the city as we know it today, not necessarily in terms of its physical aspect -because of the inertia of property and street networks- but more in the way people live and use the city. Taking care to avoid falling into a monolithic vision which could rapidly turn into a totalitarian one as we have seen in the past, we have tried to imagine the most "desirable" features taking the aforementioned energy prospects into account:

- ***New buildings*** do not use fossil energy for heating and cooling and most of them generate electricity: passive solar design, external over-insulation, triple glazing, heat recovery on extracted air, earth tubes and so on are common features. All roofs are covered with thermal solar and PV panels instead of the once traditional tiles. A bike shed is systematically integrated into any new building design.
- ***Existing buildings*** – including very old ones – have drastically reduced their energy use for heating purposes, which is limited to 50kWh/m^2/year (i.e. half the regulatory level for new buildings in 2000).
- Most heating systems, regardless of their size, are based on ***cogeneration***, which means that they generate electricity at the same time as satisfying heating requirements. ***Smart networks*** make it possible to regulate scattered electricity production.
- ***Fuel poverty*** due to poorly insulated homes has disappeared as a result of the very low incidence of energy prices on heating costs for very low energy buildings.
- ***Trips*** are now predominantly made on foot, by bike (including using electric bikes or 2 and 3-wheel vehicles) and on public transport. Travelling by car is no longer usual and is reserved for specific uses.
- Neighbourhoods are protected from car traffic, which has seriously decreased since peak oil. ***Public spaces*** (squares, streets) are used by citizens; they provide easy access, both on foot and by bike, to all public services including bus and tram stops. These well planted areas are designed to bring nature into the city and to cool down urban areas.
- Both the population and ***local players*** are given a more active part in the design and implementation of urban projects and the spreading of a "green" culture within society has made it possible to change "non sustainable" behaviour and habits.
- Fuel prices (and population aging) have put a stop to ***urban fragmentation*** which began in the 1970s. There is increasing demand for sustainable urban development, especially in cities planned on a human scale, and for medium-sized cities and villages well connected to urban hubs.
- ***Most large commercial and leisure centres*** on the outskirts of cities have disappeared or been restructured. Food and convenience stores have moved back to living areas under the combined pressure of the drastic decrease in car use and stronger demand for more proximity and conviviality.
- ***Competition*** between businesses, designers, developers and architects has led to the development of very low energy homes producing a minimum of emissions but providing a maximum of comfort and pleasure.
- ***Lighting*** is provided by low energy systems (type LED) with priority being given to natural daylight.
- ***Energy supply*** mainly comes from renewable sources (solar, wood, geothermal and wind energy) or from energy from waste (domestic waste, cogeneration). Economic activities are directly linked to energy production, imported energy being replaced by local jobs.
- A new ***city-countryside*** relationship has emerged, especially through the development of energy crops to supply the city. The management of peri-urban territories has been reconsidered accordingly to limit waste of space. The agricultural overproduction crises of the last century -food crises, in fact- have disappeared and ***agricultural land*** is now used to produce food, materials and energy.

- The energy and climate ***indicators*** in a territory are considered by local authorities to be key indicators, along with the employment rate, the number of habitants and safety; State funding for local authorities is calculated on the basis of the territories' climate and energy performance.
- After a period marked by the accumulation of physical goods -and tranquilizers- in the 20th and early 21st centuries, the ***value*** system is now oriented towards the pleasures of living, meeting people, educating oneself and inventing. The culture of quantity and uniformity which prevailed in all areas back then has been replaced by a culture of quality and diversity. In the scale of values, what we are is now more important than what we have and the long-lasting crisis which began at the end of this century's first decade has accelerated such a mutation.
- The demand for territorial cohesion is now deeply rooted as it is perceived by the population as protection against the risks of globalisation, a phenomenon which reached its climax at the beginning of the 21st century. We have rediscovered the virtues of ***urban planning*** as a way of controlling land use and space organisation based on criteria other than ground rents.

The list could go on and on. We are all invited to contribute to the inventing and co-building of such a utopia. Utopia? Let us try another approach: once the surprise has worn off after reading this list, what examples would you say are not desirable, or even realistic? Who would claim that city attractiveness -and we know how important this is in a globalised economy- can be based on a pattern that goes against the above described trends? Are there trends that call for the following comments: *"no, we should not follow this path"*, "*this is not right or reasonable*". Some may say *"that would be too good to be true", "it will be difficult", "we are not there yet", a*nd we can but agree with them.

Politics is not about *following* trends (forecasting)*,* even when we try to mitigate undesirable effects. In this case, we always end up being forced to conform, whilst experiencing the frustration that comes with beating a retreat. On the contrary, it means giving ourselves the means to *change* the course of the trends, by projecting ourselves into a sustainable and desirable future, and then defining a sufficiently flexible strategy to make it come true. This is what we call *backcasting*.

3. TERRITORY AND ENERGY: WHAT RELATIONSHIP?

Energy Cities. The name of the association is made up of two words: *Energy* and *Cities*. On the one hand there is a *territory*, a city, including its peri-urban area and on the other hand, a flow*, energy,* that runs across the territory, feeding it and allowing it to live, produce, be on the move and provide entertainment, whilst generating local and remote pollutant emissions by its generation, transmission and transformation in the territory and elsewhere. Since its creation in 1990, the relationship between *energy* and *territories* has been central to the concept underlying the association's activities. *Energy* is one of the rare utilities – with *water* and *air* - that are absolutely necessary to mankind's life and survival. All three elements, however, have a different relationship with the territory and, more importantly, are considered differently by territorial managers, that is, local authorities.

Water, air, energy and territories…

Water, indisputably, has always been a territorial issue. The first human settlements appeared close to water. And when the water requirements of urban populations began to exceed what local resources could provide, the water collection perimeter increased in a concentric manner, water being gradually collected increasingly far away from the city. Issues relating to the quality of domestic water supply then became subject to local, national and European regulations. The issue of 'waste water' was first 'solved' by discharging it down river from the city, as a free 'gift' to riverside residents and towns and cities further downstream. The second step, which is still far from complete in Europe, involves enacting national and European regulations imposing legal requirements to protect territories from the impact of pollutions generated in another territory. This shows that the need to treat wastewater to protect other territories is not self-evident. As for problems related to climatic accidents such as storms or tornadoes, these are also considered to be a territorial issue involving risk management/anticipation, emergency preparedness, safety of people and property, etc. Nobody, however, contests the fact that water is a territorial issue (i.e. that concerns *a given* territory) and everybody pays close attention to available resources, usually by trying to preserve them as long as possible, without always being able to do so or to take the measures required by the situation.

Air is a different matter. Concerns about the availability of sufficiently pure air that does not damage health are a recent development entirely linked to the emergence of cities. As soon as local populations living in a given territory become concerned by this lack of pure air, public authorities feel accountable for it and take action. National and European authorities, however, have had to legislate, for example with the framework directive on the quality of ambient air published in 1997 and its transposition into national laws. But it has to be noted that a difference in attitude appears when moving from a local scale (i.e. generating local nuisances *in the territory*) to a wider one (i.e. pollutions generating nuisances *outside the territory*, e.g. climatic accidents, migration), or when taking the viewpoint of the oft-referred to unborn generations (the famous 'future generations'). Accountability tends to ebb away when the consequences are extraterritorial and anonymous and even when the territory is held responsible for said emissions, the degree of response will depend on the civic consciousness of the local authorities. Of course, the intensity of the discourses, measures and policies developed at national and European levels is of paramount importance to increase said level of consciousness. A global consciousness has emerged in the wake of climate change problems and international negotiations, leading to an increasing social demand for better integrating climate issues into local policies. The voluntary commitment of several thousands of mayors to the Covenant of Mayors[3] in Europe is an example of this. However, even local authorities aware of their responsibilities regarding greenhouse gas emissions experience difficulties in translating their emission reduction targets effectively

[3] www.eumayors.eu and www.energy-cities.eu/Covenant-of-Mayors,1424

into their policies. There is a risk that new international climate negotiation failures – unfortunately predictable in Cancun – will lead to a decline in this collective consciousness and therefore, undermine the efforts engaged so far. And this leads to the risk of seeing climate change mitigation policies rank second[4] behind adaptation policies, which are typically territorial (see the section on water above) because they concern people living in the territory whom the local authority must *absolutely* protect.

So, what about ***energy***?[5] The *first industrial revolution* (coal -> steel industry -> railways -> steam engine) and even more so the second (oil + interconnected electricity + gas) have freed territories from their dependency on locally available energy resources, thus encouraging the development of cities. Freed of these constraints, cities could expand without limitations *as long as they could be supplied with energy exogenously i.e. from outside the* territory. This led to the virtually unlimited expansion of cities, encouraged by an equally extensive energy supply via networks linking cities to primary (gas, oil) and secondary (electricity from power plants) energy sources. In turn, the development of cities amplified the process. Cities began to feel less responsible for the upstream (resources) and downstream (discharge and waste) impacts of their activities and related energy use. They lost the habit of taking locally available energy potential[6] into account. They stopped considering energy as a territorial issue and accepted that it is becoming an (almost) exclusively extraterritorial matter, of no concern to them. As long as energy comes in smooth supply.

The leap in oil prices in 2008 and the looming prospect of *Peak Oil*[7] are putting economic, social and territorial cohesion at risk, thus rekindling the interest of territories in energy savings and the use of local resources. Are territories starting to *look again at themselves*? Investigating their underlying potentials? Reintegrating energy as a territorial issue, that is, an issue the territory *feels responsible for*? *The third (post)industrial revolution* is characterised by the emergence of information and communication technologies (real-time information and transmission, regulation, programming, dynamic management of networks, smart metering) capable of transforming energy systems. They come along with technologies for capturing energy flows (air, sun, biomass) and locally available energy resources (geothermal) as well as improving energy efficiency (heat pumps, engines, CHP) and manufacturing new materials to avoid energy loss (insulation).

This revolution is stimulating the development of a tertiary economy with energy services whereby the (inexhaustible) intelligence of men and women is used to save (non-renewable) energy. This third revolution has started to leave its mark on the energy history of cities. Unheard-of projects are emerging to exploit local energy potential in cities and their surrounding areas, involving a large number of players most of whom are not from the energy sphere. This potential mainly falls into two categories: energy savings and the energy efficiency of the urban *system* (and not just the objects – buildings, cars, industries – that make up a territory) on the one hand, and the use of locally available or usable energy resources on the other.

[4] Except if they open up to energy as an issue in itself more explicitly; see below, as well as the paper entitled *"Climat et Energie avant Cancun… et après''*, Gérard Magnin, November 2010.

[5] See *''Les villes et l'énergie: entre le passé et le futur''*, Gérard Magnin, November 2010.

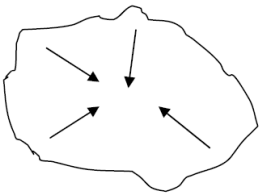
[6] This attitude is less obvious in countries where cities are responsible for energy supply, as is the case in federal and Scandinavian countries. These cities are generally quicker to take up the new emerging energy paradigm.

[7] Peak Oil is becoming a topical issue that goes well beyond the scope of environmental activists and ad-hoc experts. A recent report by the Bundeswehr think tank has alerted the German government to the economic, democratic, geopolitical and military consequences of *Peak Oil*.

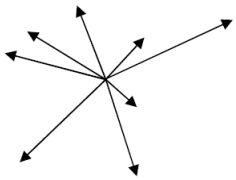
Territory and network, networking territories

Elected representatives are appointed by the population of legal age living in the territory. It is this population that elected representatives are supposed to serve, a mission that is entrusted to the territorial civil servants they employ. Strictly speaking, the impacts of a policy on populations that *do not belong* to the territory, either in terms of *time* or s*pace*, are not covered by elective mandates in a *representative democracy.* The populations that have not yet come into being do not have their say in the matter, and in an ageing population, the future of unborn generations is determined by those electors with the shortest life expectancy. The same applies to remote populations who are subject to decisions made in our territories and impacting ecological balances. These extraterritorial and extratemporal populations that cannot express themselves can only rely on NGOs to stand up for them. This is why *participative democracy* is so important. The climatic issue – and this really is a new development – has contributed to bridging the gap between the local and global levels, but not to the point of questioning significantly Western urban development choices.

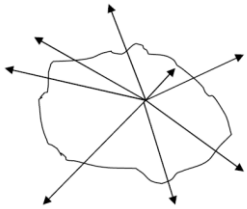
If you ask someone to draw a territory[8], you will most likely obtain a drawing similar to that on the left below: a closed, circumscribed and rather self-focused shape. The same exercise for a network will give something like the middle drawing, or even more complex: the main feature here is that the network *links up* with something external such as the rise of emerging countries, democratic risks, the financial crisis, national legislation, European policies, budget deficits, climate and energy constraints. In reality, territories operate as a network, as shown in the right-hand drawing.



a territory



a network



a networking territory

A *territory* must look at itself, this imperative being even more important than in the past, to identify its own human, natural, economic etc. potential and to mobilise its territorial intelligence. The quest for a territorial identity is a quite common antidote to globalisation, which is seen as an anonymous process. But one can easily understand that a reductionist territorial approach would be somewhat restrictive if it missed out networking, a wholly complementary dimension of the territory.

Whilst a territory can be a confined space, a network is always open. We must therefore bear both notions in mind if we want to avoid having two parallel attitudes co-exist in a territory, without ever intersecting or mixing together. It is not uncommon to see cities increasingly opening themselves up to global climate and energy issues, whilst others maintain a more conventional territorial strategy practice that ignores said dimension or only takes it into account in an extremely marginal way. The cities held up as an example at European and global level are those that try - sometimes successfully - to combine both dimensions, those that take responsibility for their energy and climate impacts whilst prioritising quality of life. This attitude must be encouraged by public policies and the *Covenant of Mayors* can help support such a strategy at European level. Special attention must therefore be paid to the interaction between a given *territory* and the *flows* crossing it: water, materials and

[8] Borrowed from Jean-Yves Prax, POLIA consulting

energy[9] for inbound flows; waste and emissions for outbound flows, these having a territorial and extraterritorial impact. The climate and energy issue must be considered alongside with other territorial policies and vice-versa.

This evolution goes hand in hand with an increasing social (and mostly urban) demand for better ***health***, reduced obesity and ***softer modes of transport***; more ***natural areas*** in cities; ***shorter circuits*** for food supply and other resources indispensable to human life; ***shorter distances*** between working, living and leisure areas; ***reduced vulnerability*** to the ups and downs of the global economy, especially for the ***poorest populations*** and those experiencing impoverishment; local, sustainable ***jobs*** in activities centred on the territory and, therefore, not relocatable; an ***ecology*** of life, urban activities and global concerns and a worldwide communication via the Internet; and more ***attractive*** territories where quality of life is 'sustainable'; in short, a demand for improved territorial ***cohesion*** in a globalised economy.

How not to see the possible synergies between this rising social demand and the new energy responses? This heralds the emergence, and not just on the fringe, of new trends which, in addition and complementarily to those conventional energy systems[10] based on a *'top down'* supply-side logic, are inventing a system based on demand for comfort in winter and summer, quality of life, local jobs, soft mobility and solidarity, thus creating a '*bottom up'* energy model of a '2.0' type, by analogy with the Internet culture of young generations in this early part of the 21st century. But injecting '*smart grids'* into an old 20th century system will not be enough to change its conceptual design. New forms of governance and democracy and behavioural change are also needed.

But is all this obvious to the various policy makers in cities?

[9] According to Pierre Calame, a typical Chinese village knows more about its energy flows that any Western metropolis.

[10] We often confuse "energy" with "electricity", whereas electricity only accounts for 20% of energy end-use. Having said that, the "electricity model" overdetermines the "energy model" of a country. In an electricity model based on CHP, CHP units are close to dwelling units and the heat generated is used to supply heating networks. When the priority is given to centralised electricity generation, a situation which involves some additional risks, heat cannot be used because the plants are too far from living areas. Heat, renewable energy and decentralised energy policies are conditioned by the electricity system, which is itself predetermined by the centralised or decentralised model chosen at national level (France and Denmark being two extremes in Europe).

4. DIFFERENT PLAYERS, DIFFERENT LOGICS

I have often attended meetings of political representatives and technical officers in charge of urban strategy and planning, the most recent events including a town planning agency conference and a workshop on cities' urban strategies. The presentations are almost always centred on the territory in the strictest sense, covering notions such as surface areas, populations and their evolution, economic trends, unemployment rate, infrastructures, social problems, relations with private players, quality of life, economic development strategies, planning and transport, that concern the *inside* of the territory. When mentioned, the *outside* usually refers to the relations with the immediate environment, other urban clusters and the capital city, or competition with other large cities for those that aim to play a role on the global scene. As for climate change, although it is quite the thing to refer to it, it is usually in the form of a general mention. In this world, energy flows entering cities and those leaving them under the form of external pollutants (e.g. CO_2 emissions) are hardly ever mentioned, nor is the relationship between the policies and decisions that have a long-term impact on the structure of the territory and their associated climate and energy repercussions. [11]

At such meetings I usually ask a question a bit like: *"I appreciated your presentation, but at no time did you mention the energy necessary for making what you have just presented actually work. All these development, town planning and infrastructure strategies of yours will end up using energy. Have you considered this point?''*. This type of question is quite disturbing. Apart from a minority of speakers who answer "yes" or say that they do not feel concerned, and after much talk about *'how important energy and territories are'*, two types of response prevail. The most frequent goes something like: *"Energy does not come within our remit: in our country it is the State which is responsible for energy matters".* This type of answer belies a very traditional representation of energy whereby 'energy = electricity + gas = large national or European companies'. It usually ignores the multi-faceted nature of the energy issue within cities. The second type of answer comes from more cautious academics and may be summed up as follows: *"Energy is one thing, but there are also many other parameters that have to be factored in and which are not less important; so there is no reason why this subject should be given greater importance".* This type of answer often reveals a determination not to let oneself be disturbed by an additional parameter because this would question many of our ways of thinking, habits and practices. Amongst town planners for instance, the integration of energy aspects is sometimes considered to restrict creativity in building designs.

Urban planning and Energy: an odd couple that must live together

Gérard Magnin, Energie-Cités, Berlin, 6 September 2009

International Federation of Housing and Planning (IFHP) Congress - Extracts

Urban planners hold the keys to climate protection and our energy future, but they are usually unaware of it. Urban planning and energy have been separated for a long time. They must now live together.

On the one hand, urban planners design cities with their own tools, using criteria from specific schools of thought, for example the Athens Charter, which made a dogma of separating the various urban functions. For urban planners, the energy issue is at best a 'network' issue, a system of 'underground' infrastructure supposed to supply energy to the city or the neighbourhood. They pay little attention to energy uses, even though these are predetermined by urban planning decisions, whether in terms of buildings or mobility. The energy 'technique' is here to provide adequate solutions!

Energy specialists, on the other hand, are concerned with technical equipment, gas, electricity and sometimes

[11] The Mayors engaged in the Covenant of Mayors are encouraged to do so, and an increasing number of them are already taking this into account, but we are just at the beginning of a new era.

heating (and cooling) networks. Energy is produced and distributed according to the building energy needs. Quantity does not matter as long as energy is available. The issue of transport (albeit a typical energy issue) is not energy specialists' concern. In fact, issues as essential as people's everyday life have been dealt with in a purely technical way. *Progress* is measured by the capacity of the so-called developed societies to free themselves from environmental constraints (resources, discharge, emissions, etc.), thus demonstrating the ability of Mankind and Technique to dominate Nature. Our economic indicators are positive: increasing energy use, more private cars to facilitate the essential functions of everyday life. We now see the result of all this!

This situation still prevails today at global level and in Europe, while the post-Kyoto period is being discussed in Copenhagen.

But changes have started to appear in people's consciences:

- The fact that this town planner conference has placed the relationship between urban planning and energy -more precisely energy efficiency- on top of its agenda is evidence of this.
- Some energy specialists are taking greater interest in the rationality of energy end-uses.
- An association such as Energy Cities combines both dimensions –'Energy' and 'Cities'- in its very name. Its 20th anniversary in 2010 will focus on *Energy* and *Quality of life*.

The energy paradigm is also changing:

- In the past, the paradigm was a 'top down' one (Production -> Transport-> Distribution-> Consumption) and productivist logics –and thus, producers' interests- always prevailed.
- It is now gradually being replaced by a 'bottom-up' approach, centred on the needs of consumers, who can easily become producers when (usually solar) production units are integrated into a building or the neighbourhood (Integrated production and consumption -> Collection and Distribution -> Transport > Production).
- Urban practices have changed with the advent of very low energy -or even positive energy- neighbourhoods, and a new city is being invented:
- The dichotomy between production and consumption is gradually ebbing away, replaced by consumption and production integration, the primacy being given to the demand side.
- In other words, 'common sense' is back: human beings do not need energy as such, they need comfort and services (for heating, lighting, entertainment and mobility, etc.); progress therefore consists of using as little energy as possible (or even no energy at all) whilst mobilising a maximum of locally available resources (sun, wind, water, ground, biogas, biomass, etc.).

This totally new approach requires involving people who usually consider themselves to be outside the energy sphere but who have a strong impact on our energy system. Changes in energy concepts and techniques will necessarily influence the urban planning approach.

This raises many questions, including: what is the point of building shopping centres in the middle of nowhere that are only accessible by car? Is the urban density necessary to maintain a territory's energy performance compatible with quality of life? Are 'low energy' cities better of worse places to live?

I defend the idea that energy is not an ordinary parameter, nor a commodity like any other. It is a ***common good*** that cannot be reduced to a marketable product supposedly designed to bring long-term economic, social and ecological balance. Energy is indispensable to any human activity and no human community can survive without energy. Any adverse event affecting energy in the future at global level will have local territorial repercussions. Consequently, reducing as much as possible the energy vulnerability of territories, their activities and inhabitants must be a priority of and integrated in all territorial policies. Any territorial decision has an impact – either positive or negative - on energy end-use, the type of primary energy, the local economy as well as emissions and discharge. Territories must therefore be considered as they relate to the rest of the planet, which is not a simple task.

No significant progress will be made, however, if the defenders of each logic refuse to mutually understand

the other's logic. The supporters of the 'energy-climate message' must therefore show proof that improving energy efficiency by 20%, raising the share of renewable energy to 20% and reducing CO_2 emissions by 20% by 2020[12], and then continuing to reduce these trends on a larger timescale is a *plus* that will help meet the challenges territories are currently confronted with. Examples of this include: the economic and social integration of underprivileged populations, functional and social mix, the transitions towards a new energy paradigm, job creation, the development and maintenance of skills, mobility and transport, the relations of cities with their peri-urban and rural environment, quality of life and cities' attractiveness, local financing and citizens' involvement through new modes of governance.

[12] These are the objectives adopted by the European Union in its Energy & Climate Package in December 2008.

5. TERRITORIAL COHESION AND ENERGY: IN THE EUROPEAN UNION TREATY AS WELL

It is in this context that the Treaty of the European Union – the so-called Lisbon treaty – has simultaneously integrated two newcomers: ***Territorial Cohesion*** and ***Energy***.

'*Territorial Cohesion'* now completes the famous *'Economic and social cohesion'* from the earlier treaties. This means that all EU policies will have to be considered also from the territorial angle. The notion of Territorial Cohesion is still vague and we are all invited to help specify and illustrate this concept, which is one of the aims of this paper. Let us make ours the definition given in the European Commission's Green Paper[13]: *"From the frozen tundra in the Arctic Circle to the tropical rainforests of Guyane, from the Alps to the Greek islands, from the global cities of London and Paris to small towns and villages dating back centuries, the EU harbours an incredibly rich territorial diversity*. ***Territorial cohesion is about ensuring the harmonious development of all these places and about making sure that their citizens are able to make the most of inherent features of these territories****. As such, it is a means of transforming diversity into an asset that contributes to sustainable development of the entire EU.''*

As for ***Energy***, it entered the Treaty by the back door, the Member States being reluctant to delegate their supply policy to the EU. The Treaty[14] stipulates as follows:

> *"In the context of the establishment and functioning of the internal market and with regard for the need to preserve and improve the environment, Union policy on energy shall aim, in a spirit of solidarity between Member States, to:*
>
> *(a) ensure the functioning of the energy market;*
>
> *(b) ensure security of energy supply in the Union;*
>
> *(c) promote energy efficiency and energy saving and the development of new and renewable forms of energy; and*
>
> *(d) promote the interconnection of energy networks.''*

The focus on the internal market comes as no surprise but as far as potential interactions with Territorial Cohesion are concerned, *point c) "promote energy efficiency and energy saving and the development of new and renewable forms of energy"* is worth noting. The combination with what should allow territories and their inhabitants to *"make the most of [their] inherent features"* may prove extremely fertile and a major driver of innovation[15].

For example, Energy Cities has put forward the concept of 'energy subsidiarity', which consists of looking for solutions as close as possible to the problems to be solved using the territory's potential in the following order: 1) the locally available energy saving and energy efficiency potential; 2) the renewable energy or energy from waste potential available in the immediate surroundings, and then 3) exogenous complementary supplies in a concentric manner. The quest for greater energy autonomy is going to take an even more important place in local policies and cities aiming at a 100% renewable energy future are already

[13] http://ec.europa.eu/regional_policy/consultation/terco/paper_terco_en.pdf
[14] Article 176A
[15] The 5th Report on the Economic, Social and Territorial Cohesion Policy published in November 2010 states as follows: "the EU energy policy also has potentially important differential effects on regions but has no regional dimension as such. The objectives are to maintain a competitive energy sector and achieve a sustainable and secure supply". Extract from the 5th Report on the Economic, Social and Territorial Cohesion Policy.

targeting such objectives.

It is not impossible that contradictions might appear between Territorial Cohesion and the principles of the energy internal market. For example, developing local energy supplies will have a positive impact on the local economy, employment, forestry, waste management, poverty and social inclusion, innovation and so on; but this might also come up against policies dictated by the internal market and competition rules, which stipulate that energy has to be supplied from the cheapest source at the time we need it. Which will prevail in case of conflict? Free competition, which now benefits from the might of the law? Or territorial cohesion, which is still in its infancy? There is still a long way to go and only territorial initiatives will be able to flesh out this new concept. The Committee of the Regions has a pivotal role to play in this.

6. COMPLEXITY OF URBAN SYSTEMS AND UNSOLVED QUESTIONS

Aiming at a European city with CO_2 emissions divided by a factor of 4 or 5 by 2050 involves imagining a city using 2 to 3 times less energy, mainly produced from renewable energy sources. This is the objective referred to by the European Union and the United Nations (UNFCCC) that seeks to limit the average rise in global temperatures to 2°C, as recommended by the IPCC and these are the figures calculated for the so-called industrialised countries on the basis of the general objective of dividing global greenhouse gas emissions by half. There is no need to restate that current trends on all continents, although with some differences, are not leading to this objective, and are sometimes even going against it. The failure of COP[16] 15 in 2009 in Copenhagen probably marked the beginning of a long period without binding international agreements. The International Energy Agency did not fail to point out the risks involved in terms of rises in oil prices, which are expected to double by 2030 if the demand for hydrocarbons remains as it is[17]. This means that the main, not to say the only lever for reducing fossil energy use is climate mitigation. What will happen in 2012 if the post-Kyoto negotiations are a complete failure? Such a risk[18] cannot be totally ruled out in view of the difficulties experienced by the G20 to come to an agreement on short term issues, such as exchange rates, which are closely related to countries' economic interests. It is therefore indispensable to consider energy as an issue in itself, and not just as a by-product of the climate issue. We should be talking not only of a *post-carbon city,* but also of a *post-fossil/fissile energy city*, which will invariably have to be a *low energy city*.

The notion of climatic performance is gradually being imposed at macro-economic and macro-political level

The process started in Rio - which found temporary completion in the Kyoto protocol currently at stake - and of course the IPCC works that have preceded and accompanied this process have made it possible to measure and compare greenhouse gas emissions at national and supranational levels and to make them public. Each country involved in these agreements committed to figures-based targets and to implementing policies to reach them. The resulting schemes were supposed to lead to an optimal allocation of the financial resources so as to obtain the best results at the lowest cost.

It is quite easy to understand why such agreements are difficult to reach. The process to be put into place involves what are essentially 'rationing coupons' applicable to emissions, and indirectly to energy use. The objective is to co-manage the global climate using a combination of cap and trade mechanisms by creating supply scarcity. In Europe, the Emission Trading Scheme (ETS) applicable to all energy generation installations producing over 20 MW follows the same logic.

However, this may imply that the policies to be implemented are a matter for heads of state, governments or international organisations, and concern very complex issues that only specialists can understand and solve. We may feel, for example, that reaching agreement at international level is enough to solve a problem, whereas in fact this just means that we can start working on a solution and that everything still remains to be done. The Copenhagen failure has sent a negative signal to all global players, but its success

[16] Conference of Parties (countries having ratified the Kyoto protocol)

[17] World Energy Outlook 2010, International Energy Agency (IEA), 9 November 2010. IEA has appealed to governments to implement their climate pledges vigorously to avoid a doubling of oil prices *"The age of cheap oil is over, though policy action could bring lower international prices than would otherwise be the case".*

[18] *"We will spare no effort to reach a balanced and successful outcome in Cancun"*, the G20 said in a statement issued after its meeting in Seoul on 11-12 November 2010, in which heads of state and government reiterated their commitment to take strong action to fight climate change.

would not have produced the miracle solution to all the problems. Beyond the famous *"The American way of life is not negotiable"* of G.W. Bush – a statement that had at least the merit of being frank – we see that lifestyle and consumption dimensions are very present, thus making a consensus even more difficult to reach, except on underlying financial issues[19]. All these events may seem of remote interest to citizens, although people do benefit from an acculturation to climatic issues on such occasions.

On the ground, at the far end of the chain, the notion of climatic or energy performance is becoming part of our everyday life

The 'energy label' for *household appliances* led the way, and was subsequently extended to a number of domestic products. This was the result of a European directive, after promotion and testing of the concept through regional initiatives. The market for said products underwent a deep and unexpectedly rapid transformation, to the point that all refrigerators are now classified as A, with +, ++ and +++ signs marking the difference in the absence of a new system to update the initial scale. We all know what this energy label looks like.

In the *car industry,* the reference to CO_2 grammes per km has gradually become an easily understandable indicator for consumers. It is now almost as important a criterion as consumption in litres per 100km, which still remains the essential criterion for calculating the actual cost per km of a vehicle. The compulsory display of CO_2 performances, combined with the application of European directives, has largely contributed to this situation. The general trend is one of a general improvement of the performance of vehicles, the system of 'no-claims bonus – extra premium' contributing further where it is applied[20].

The notion of energy performance is now taking a predominant place in *buildings*: in addition to the former thermal regulations - which only concerned specialists - we now have *'low energy buildings'* (40 to 50 kWh/m^2/year), *'positive energy'* or *'passive' buildings* (15kWh/m^2/year) and even *'2 litre'* buildings, those needing only 200 litres of fuel per year to heat 100 m^2, i.e. 2l/m^2/year. These terms are unknown to the general public, but an increasing number of citizens and consumers understand what this is all about, even if the choice of possibilities is giddyingly vast! It has to be highlighted that all these initiatives relating to buildings were promoted at the local level, at the initiative of local authorities and/or groups of citizens, with the support of research institutes[21]. The energy label is now widely used in buildings[22], under the influence, once again, of a European directive[23], which stipulates that all buildings constructed as from 2020 will have to use "as close to zero energy as possible". With such low levels of energy use, renewable energy supply has become indissociable from energy performance. In this respect, the impact of '100% renewable energy' targets on the energy performance of a building or stock of buildings is not negligible, as reaching such a target requires consuming very little energy to break even.

What all the above examples have in common is that performance is applied to 'objects': a bulb, a refrigerator, a boiler, a vehicle, a building etc., whose intrinsic characteristics can be measured. In the case of a vehicle or a building, the human component is important, since the way we 'drive/manage' an intrinsically efficient object has an influence on its final performance, which is a combination of both 'objective' and 'subjective' factors. But in the above cases, the intrinsic performance of the 'objects', which is the result of technological progress, is a determining factor that does not require modifying our lifestyles significantly. This explains why reaching a consensus on these principles has been (relatively) easy. However,

[19] The Climate negotiations have led developing and emerging countries to raise the issue of the historical responsibility of industrialised countries in climate change and accordingly, to ask for compensation. We can see here that climate issues reveal problems that go well beyond the initial context.

[20] France has set up such a system: the level of CO_2 emissions for new cars is 130.1 grammes in 2010, compared with an average of 141.16 grammes in the EU as a whole.

[21] Such as the Passiv Haus Institute in Darmstadt (www.passiv.de/07_eng/index_e.html)

[22] Energy Cities launched the Display campaign for public buildings in 2005 (www.display-campaign.org)

[23] European directive on the energy performance of buildings, updated in 2010 http://eur-lex.europa.eu/JOHtml.do?uri=OJ%3AL%3A2010%3A153%3ASOM%3AFR%3AHTML

the necessary modifications to the production processes, especially in the building trade, have often met with opposition from the sector's traditionalists.

What is a 'low energy city'?

Like any appellation, the term *'low energy city'* is restrictive. It draws an analogy with now well-known precedents – *'low energy lamps' and 'low energy buildings'* - which have demonstrated that energy savings can be a source of financial savings and increased comfort. The term *'passive city'* is not very attractive and *'Factor 4 city'* is difficult to understand. The *'post-carbon'*[24] or *'low carbon' city* is also too complicated. But energy is a term that most people can identify with because they have to pay for it every day, month or year. Note that the low energy city also implies '*an energy supply predominantly based on renewable energy and energy from waste'.*

The *'low energy city'* needs a territory that is reconciled with/feels responsible for its energy supply, that measures its energy use by sector and by area, that assesses its impact on natural resources and that monitors the emissions and other waste generated by its energy use so as to be able to significantly reduce them by implementing figures-based targets in line with global and European macro-economic objectives as a minimum requirement.

Such a city also requires local authorities to cross-reference all their sectoral policies (construction, renovation, mobility, town planning, culture, economics, education, social, health, food, youth, sports, green areas, highways, waste, water, etc.) with short, medium and long-term energy and climate objectives, which implies that all these objectives are negotiated at an early stage when preparing policies or projects that have an impact on, or are impacted by energy issues.

It means looking for solutions that are as close as possible to the citizens and to the problems to be solved by mobilising local resources in a systematic and integrated way, starting with energy efficiency and energy savings within the urban system, then using locally available renewable energy resources, and then turning to complementary exogenous supplies in a concentric manner. This is what we call *'energy subsidiarity'*.

The low energy city has to reintroduce some 'common sense' into the way we think and take action; human beings and economic activities do not need energy as such, they need to have end-uses satisfied (for heating, lighting, entertainment, fresh air, shopping, producing, moving etc.). Satisfying such needs with the smallest possible amount of energy (and sometimes no energy at all) whilst mobilising a maximum of readily available local resources (solar, wind and water energy, energy from the ground, biogas and biomass, human energy, etc.) is compatible - even more so than we may think - with a high quality of life, economic prosperity and social justice.

The notion of territorial energy performance – which is, by nature, systemic – remains to be defined

As already said, territories lie at the junction of two dimensions. Awareness of the complexity of the stakes and challenges on the one hand and awareness of the importance of local action to attain global targets on the other have led local authorities to not only refer to global and European targets, but also to commit to reaching them in their territories.

[24] A major research programme led by the French Ministry of Ecology

Whilst cities are committing to 'global' objectives (3x20, Factor 4, etc.), their action concerns 'urban objects' (buildings), neighbourhoods (retrofitting, new developments) and urban policies (mobility, town planning, economy, social action, etc.). But in most cases, as with the above examples, these two dimensions continue to simply coexist with no real sign of integration. The boundaries are starting to blur but there is still a long way to go. The dividing line between those cities really committed to changing their energy trajectories and other cities is the ability to bring all public policies into line with the territory's climate and energy objectives, or at least to integrate these objectives systematically into all public policies, because such policies can be affected by any situation of energy vulnerability.

It is not easy to translate these macro-economic objectives into practical targets and operational measures. 'Factor 4 by 2050'? Declaring oneself in favour is quite easy when the deadline seems so far away. But what does a *'Factor 4*' city look like? What does it mean in terms of lifestyle, quality of life, social justice and economic activities? The same applies to a *'3x20'* city, even though the deadline is closer, almost within the range of the short term today. We are clearly at a loss for concepts and practices that will help us imagine the potential futures of such a city. This is why Energy Cities launched the *IMAGINE (the energy future of your city within one generation)* initiative.

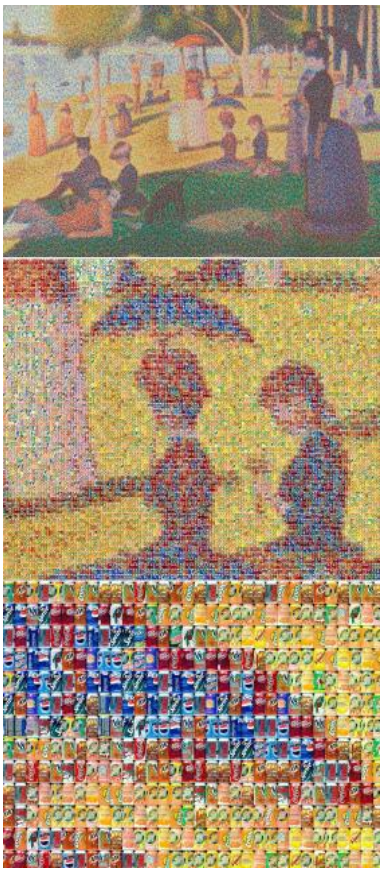
Another difficulty lies in the ability to measure the impacts of policies on a territory, in a complex system that is in a state of constant interaction, movement and flux. We know how to measure the impact of the substitution of a biomass boiler for a coal boiler, and we can even become players on the carbon or energy-saving certificates market. But measuring the impact of the creation – or disappearance – of a convenience store, a '20 mph' area or 50 km of cycle paths is more difficult, even more so when these measures are amalgamated[25]. Innovation is not just a technological issue and there is a net deficit of social science research on these subjects.

Being able to measure territorial energy consumption and its related emissions, for example using the inventories that the Covenant of Mayors signatories have agreed to produce with their Action Plans, is a real step forward.

It follows from the above that at the level of a city, we are talking here of a *'system'*, that is, the interaction between either stationary or moving 'objects' in a territory on the one hand and human intervention, including lifestyles, on the other hand. A town planning model that does not integrate the mobility generated by the position of the objects in the territory (leisure facilities and shops here, offices over there and housing in yet another area) would not be able to produce an efficient energy system, even with energy-efficient objects. Using a car that emits 90 g of CO_2 per km instead of 150 does not involve major changes for its owner, but using public transport or a bicycle instead of one's car is a totally different story. This is a crucial, yet demanding and difficult issue. It has a direct impact on citizen's lifestyles and modes of consumption. This is where conservative stances become apparent, these necessary changes to our lifestyles being presented as an 'infringement –usually described as 'intolerable'- of personal freedom'. This a delicate issue which places elected representatives in the front line, as by taking the risk of changing their fellow citizens' habits they expose themselves to public dissatisfaction at future elections. The way we shape our cities must change and citizens must actually want change, not just accept it.

[25] This complexity makes it difficult, or even impossible for cities to access "carbon finance", as is often recommended, notably in the Mexico City Pact that is to be submitted to the World Mayors Summit in November 2010.

7. WEAK SIGNALS



Just like dots in pointillist paintings, weak signals form an image

'Low energy city with a high quality of life for all'[26]. The point here is not to describe an ideal city, a simple product of the imagination, even if it is always tempting to do so. As Hugues de Jouvenel, Director of the French foresight review *Futuribles* said "*foresight is not just imagining the future: it is first and foremost looking at the present to identify 'emerging facts'*". He goes on to say: *"Foresight is an approach that aims to understand the contemporary world using a long time frame. There are heavy trends that are difficult to get rid of; but changes also sometimes have hardly visible roots and anticipating them requires paying close attention to weak signals. The point is to know what is at stake and be ready before the blaze breaks out, making sure that those in charge are not governed by the event. As Talleyrand said 'When it is urgent, it is already too late!'"*

What can we learn from observation of the *weak signals* emitted by the European society? Essentially that territories are beginning to come to terms with themselves. After indulging themselves in the delights of globalisation, it seems that under the combined pressure of energy and climate constraints, the rise of emerging countries and the loss of Western leadership in a number of areas, the resources held by territories have now become worthy of interest in Europe.

Territories are looking at themselves again, they are innovating, inventing new concepts and connecting people and areas. They are demonstrating that quality of life can be synonymous with a society that uses energy sparingly and produces a minimum of emissions, whilst exploiting its local potentials; a society that offers new opportunities to socially excluded categories.

Meanwhile, of course, many cities, especially in transition countries, are dreaming of the world of yesterday that they have been waiting for so long. But the objective here is to highlight what seems to be pointing at new directions, giving hope that the future is not doomed, but still in our hands! Below are a few examples.

Cycling had been completely abandoned in many European cities, so when Paris (FR) organised its comeback with the necessary infrastructures, it sent the signal that cycling is once again a serious alternative to motorised modes of transport. The fact that 50% of all journeys made in Odense (DK) or Groningen (NL) are by bicycle is a clear demonstration to other cities that cycling, far from being marginal, is a major component of intra-urban mobility plans. Whereas China is giving up bicycles to turn to private cars as a sign of its entry into modernity, cities in Europe and even the US are entering postmodernism with cycling. While the benefits to health from the physical exercise involved in riding a push bike can only reinforce this trend, electrically-assisted bicycles are opening up new opportunities by attracting new

[26] According to the European Environment Agency (EEA, 2009) "People need to breathe clean air, have access to clean drinking water and adequate housing conditions, and enjoy quiet and peaceful places. Accessible, good-quality, well-maintained green spaces and playgrounds, modern transport systems and safe, walkable neighbourhoods that encourage physical activity and social interactions are key constituents of urban quality of life". Ensuring quality of life in Europe's cities and towns **http://www.eea.europa.eu/publications/quality-of-life-in-Europes-cities-and-towns**

categories of users and extending cycling's use to more hilly areas. Local authorities' determination, combined with an increasing social demand for safe mobility, will make greater sharing of street space with cycles not only possible but also necessary. In Copenhagen, the priority given to bicycles at crossroads is forcing major changes. An increasing number of bicycles will mean more bicycle sheds in blocks of flats, as well as at schools and near shops and leisure centres. Town planners will have to integrate cycling as a mass mode of transport in their development and urban regeneration plans, thus contributing to promoting cycling. The way is open to mobility policies aiming at a 20%, 30%, 50% or even 60% modal share for cycling, depending on the initial level. Once such an objective has been defined as 'desirable', the strategy to attain it will be made easier and more easily understandable by the population. An idle fancy? Why would what is already possible here be impossible elsewhere? Only cultural obstacles can explain this. In the past, cycling was an outward sign of not owning a car. The fact that having a car is now within everyone's reach is responsible for cycling decline, but it has also trivialised car ownership. Riding a bicycle is now a new sign of social distinction, a symbol of positive values, both collective and individual. It is true that moving 1,500 kg to allow a 70 kg individual to travel does not really fit in with sustainable modernity.

More journeys made by bicycle means less energy used, reduced urban pollution and fewer CO_2 emissions, a reduced footprint and less congestion; this cost- and time-effective way of travelling offers a new way of experiencing the city as well as an opportunity to contribute to the emergence of a post-oil society. Is this not what we expect from urban policies?

Biomass has gradually become an indispensable component of any city willing to implement a renewable energy policy. Biomass used to be our favourite - and exclusive - heating fuel prior to the first industrial revolution. Preserved in some rural areas, biomass-wood disappeared from cities to be successively replaced by more 'modern' sources of energy: coal, oil, gas and even electricity. Continuing to use a wood stove for heating was a sign of resistance to what was then considered progress. Now having 'already' adopted biomass-wood is considered a sign of progress. This is what Güssing (AT), a small town with 4,000 inhabitants which produces over 100% of renewable energy, or Växjö (SE) with its 84% of heating requirements (57% of heat + electricity) covered by biomass, are demonstrating. And many other cities have set themselves 20%, 30% or even 50% targets.

Stimulated by European figures-based energy objectives that have been taken up by local authorities, the number of heat networks fuelled by wood, straw or another type of green fuel has increased significantly, as has the number of projects aimed at gradually producing biomass for heating and electricity generation purposes. What does this mean? In addition to the purely energy and climate dimension, this movement reveals a willingness to create closer and more visible links between resource and consumption areas as well as between economic flows, for it does matter to a territory whether the money spent on energy in the territory is injected locally or is used elsewhere, sometimes outside national borders. It also has to do with an increasing need to try to master one's own fate in a globalised and anonymous world which we know will not be able to indefinitely provide a readily available, stable and affordable energy offer. Fear of the consequences of *Peak Oil* is rising and a tighter control on the bare necessities of life is seen as a mark of security.

More biomass in cities' energy mix means stimulating the local economy and creating sustainable jobs; it heralds a different relationship between the city and the surrounding countryside, a new way of considering our waste, which may be a resource for others, as well as a new awareness of the territory's responsibility for its energy supply. Is this not what we expect from a balanced territorial policy?

Food is becoming a source of concern in Europe. Not for reasons relating to quantity – these are now solved – but for reasons concerning quality, health and, more recently, carbon footprint and geographic origin. In the past, we depended on food products grown near human communities. Urban development and now globalisation have put a distance between production and consumption areas, whereas high urban concentrations combined with mass distribution systems have led to intensive, standardised production of fruits, vegetables and meat. This system is more and more criticised for its lack of transparency whilst short food circuits, for both organic and non-organic products, are becoming ever more popular. Peri-urban and even urban farming are receiving renewed attention and being considered in town and land use planning. This is how the French ''Terre en Ville'' association came to exist and how the EVA-Lanxmeer

neighbourhood in Culemborg[27] (DK) has come to integrate an urban farm. Vegetarianism is gaining momentum in urban areas, especially in countries affected by 'mad cow' disease and conference organisers now systematically ask participants whether they are vegetarian or not. Vegetarianism is not considered marginal any more. There are many reasons for this, from animal welfare to the energy cost of what we eat. For a similar number of calories, a menu composed of ham, steak and French fries generates 5 kg of CO_2 whereas a menu composed of vegetable soup, potato and onion omelette and fruit salad barely exceeds 500g, i.e. 10 times less!

More locally produced food means improved product traceability and a closer producer-consumer relationship; it also carries implicit criticism of 'provenance-blind' consumption, which ignores product seasonality and origin and is responsible for long-distance food air freight. Eating less meat is also cheaper and helps farmers obtain higher prices!

CHP stands for combined heat and power generation. To optimise equipment output, efficiency and profitability, electricity has to be produced when heat is needed, which involves being aware of the building's or neighbouring buildings' exact hourly and daily heat requirements throughout the year. Equipment sizing therefore depends on heat requirements according to a *bottom up* process. It can also be calculated based on a local source of biogas or for meeting the heat and power needs of a wastewater treatment plant. In all cases, CHP involves a strong consumption-production relationship. When Frankfurt (DE) developed a strategy for small and medium-scale cogeneration, the city also promoted the concept of distributed energy, local production and energy system optimisation. This was done in the face of opposition from large operators, who prefer large production units that they can control more directly, and despite growing distrust from the population.

Producing more end-use energy locally means more security if the number of individual installations is sufficient to allow for risk pooling in case of incidents. It is also a protection against general blackout risks. People's confidence in and acceptance of large systems are declining, whereas local production is becoming increasingly popular. Expanding the scope of scattered electricity production is the objective of smart grids, a highly topical issue at the moment.

Convenience stores have entered dire straights in many countries and lost significant market share. The American model of shopping malls in city outskirts has spread to other countries, such as France, where this concept has been adopted by major food distribution companies, leading to the emergence of hypermarkets, in turn boosted by the increase in the number of private cars. The new EU Member States, hungry consumers, have rapidly followed the Western lead. But this system is starting to run out of steam in the wake of 2008's sharp increase in oil prices. The crisis has led categories of low-income consumers to desert hypermarkets to avoid being tempted to buy useless products, thus joining another category of consumers who make a principle of rejecting these 'Meccas of consumption' as a symbol of an economic system they consider to be decadent. Any prolongation of what we often assume will be a short-lived crisis would be a hard blow for these shopping centres, as malls in the United States are finding out. Convenience stores (medium-sized stores) are staging a comeback and all major hypermarket brands have been developing sub-brands to capture this market. Shopping is a deciding factor for mobility and quality of life. This is why Freiburg Im Breisgau (DE) decided in its urban planning regulations some 20 years ago to include a list of basic products to be made available only in the city centre and not in hypermarkets.

Greater proximity means improved accessibility for all categories of the population, including the elderly who cannot drive anymore and households that, whether as a result of personal choice or low income, do not have a car. It means more opportunities for going shopping, and therefore for meeting one's neighbours, on foot, by bicycle or by bus. It also saves energy.

Positive energy: these two words go well together. They have been used to describe constructions whose energy consumption for heating purposes is close to zero and which produce more energy, usually from PV panels, than they use. This technological feat is not so uncommon, especially in Germany, where the concept was born. But beyond that, trying to understand what lies behind this strong signal is an

[27] http://energy-cities.eu/IMG/pdf/Sustainable_Districts_ADEME1_EVA-Lanxmeer.pdf

interesting exercise. This system fully integrates energy use and production, the place of consumption being also a production site. It breaks with the conventional distinction between the building where energy is used and the production site where energy is generated and then transmitted to the place of consumption. It tends to nullify the energy impact of any additional building. Conceived as a 'network', it lays the foundations of a system in which some buildings with excess production would supply energy to other buildings in the area.

In this case, the objective is not just bringing production and consumption closer, but merging them to attain as much autonomy as possible, reduce the environmental impact, fully protect the community against energy price increases and show solidarity via the network.

Water has been used for generating power for a very long time. But the large interconnected systems have neglected thousands of power plants because they are too small for large European electricity companies. However, the trend is starting to reverse and river dams are being re-fitted, including in urban areas. No plant is too small when it comes to devising a *bottom up* distributed energy system. Even more interesting is the use of water for heating or cooling purposes. Lake Geneva has always been part of the scenery, but it is only recently that Geneva (CH) discovered its energy properties. Air-conditioning being prohibited in the city, the buildings of many international institutions are cooled by water from the lake. Helsinki (FI) uses a similar system based on sea water. Territories had lost the habit of looking at what they have, but when they do so, they discover treasures. An example of this is Heerlen (NL), which uses the heat from old coal mines to heat part of the town, thus giving the mines a new lease of life. Another is Besançon (FR) which encourages the population to drink tap water by marketing municipal water under the brand 'La Bisontine'; energy, CO_2 and financial savings are the common denominator.

Exploiting local resources to meet local needs is a new trend that contrasts with the all powerful globalisation of recent decades and reconciles territories with their readily available local resources (a lake, the sea, the sun or the wind). This century, flow energies will replace stored energies, a transition which has already started.

Poverty: an increasing proportion of the European population is sinking into poverty, including people with jobs. *Purchasing duty*, that is the compulsory expenses a household has to bear (rent, various subscriptions, energy, transport, food) has pushed the notion of *purchasing power* into the background. The weight of energy is becoming too heavy for an increasing number of households, especially in new EU Member States where local wages and European energy prices can only make for end-of-month problems. In some cases, such as in Romania, one salary may hardly be enough to cover household energy costs. In such a context, thermal retrofitting is all the more important. When the municipality of Brno Novy Liskovec (CZ) decided to retrofit blocks of flats to reduce their energy use to 50kWh/m^2/year, that is dividing it by a factor of 3, this represented €500 of savings per flat per year, the equivalent of a monthly salary. The same measures were applied in Dobrich (BG), Bistrita (RO) and Latvia. The possibility of using the European Structural Funds for retrofitting works can help promote such projects, at least in those countries where this type of measures is used. Of note here are the very high energy standards set by the latest retrofitting programmes, which do not settle for slightly improving an inefficient situation. Improving performance from 350kWh/m^2/year to 150kWh/m^2/year, for example, indeed condemns the building to never doing better for there will be no second chance!

Combining technical and social improvement opens the way to other types of progress. One unexpected example of this is the positive impact on the municipality's social action budget, which is often used to support people with insurmountable income-related difficulties. Another positive repercussion is that the social action officer suddenly feels like he or she is contributing to sustainable energy.

Neighbourhoods: in the second half of the 20th century, cities developed according to the dominant Taylorian model, which consisted of dividing up cities into different areas corresponding to different functions: here people work, here they shop, this is the entertainment area and this is where they live. Everything is either all mineral or all vegetable. Between areas, people travel back and fro, not because they have chosen to travel but because they have to. The city is not designed taking its inhabitants' expectations into account but according to more or less technocratic criteria that bear the mark of specific lobbies. For

example, because it is easier for a lorry to deliver goods to a hypermarket at the periphery of the city rather than in the city centre, thousands of people have to take their cars to increase the haulage contractor's efficiency! It is precisely to reverse this trend that new neighbourhoods were created, those of Freiburg (DE) being the most well-known and the most visited. The main idea is to centre urban design on the inhabitants, and not just on urban objects, make citizens part of the design process, give them the opportunity to develop their own living areas if they want to, enabling them to live in green neighbourhoods with local services, schools and shops and to walk or cycle without fear of cars, offering them jobs, a direct tramway connection to the city centre and very low energy or even positive energy homes. All this makes sense from an energy efficiency point of view. What does this mean? That we are reinventing the city, based on new values. Some object that these neighbourhoods are for privileged social categories, which is not true. But it is true that these families have chosen to display and pay for their convictions, as others would buy the latest BMW. Each to his own choice!

Reducing the distance between the various city functions, organising them to suit the inhabitants' expectations, allowing inhabitants to become city stakeholders and not just city consumers are the key drivers for change in these new neighbourhoods. Human beings must be considered holistically, as citizens, and not divided up into as many parts as there are urban functions or market services proposed to them.

Citizenship: Are there still collective causes capable of mobilising citizens and players in a territory? The democratic spirit is running out of steam in almost all European countries. Abstention is rising inexorably from one election to another. Populist and nationalist temptations are riding high and a feeling of helplessness makes people turn in on themselves. Local companies, however, are collectively mobilising themselves on climate and energy targets, generally at the instigation of local authorities, but not only. Energy and climate strategies often bring together hundreds, and sometimes thousands of people as early as their design phase. The feeling that everyone needs to make a personal contribution to the collective objectives is winning over an increasing number of cities, citizens and local players. Companies in Stockholm (SE) have set themselves objectives. Twelve cities from twelve countries have joined the 'Engage' project with Energy Cities. What does this mean? The depletion of energy resources and climate constraints tells us that we are living in a finite world. And in a finite world, the existential question faced by individuals is reflected in the following dilemma: use the resources, share them harmoniously and promote a world of peace; or fight for access to resources and create a world of war.

Bringing citizens and local players (who are also citizens) together around energy and climate issues, designing desirable and responsible cities, finding local solutions and sharing ideas and solutions; is this not an opportunity to rekindle social links and democratic practice focusing on subjects that concern us all and that are echoed in our own existence?

CONCLUSION

"In a changing world, Europe wants the EU to become a smart, sustainable and inclusive economy. These three mutually reinforcing priorities should help the EU and the Member States deliver high levels of employment, productivity and social cohesion. The Union has set five concrete, ambitious objectives - on employment, innovation, education, social inclusion and climate/energy - to be reached by 2020. Each Member State will adopt its own national targets in each of these areas."

This, in a nutshell, is the European Union 2020 strategy. It does not provide for anything that in principle would explicitly concern the territorial level. But what are the chances of such a policy of being implemented without the help of cities and regions? Whereas the decade ahead of us is supposed to place Europe on the track of a low energy, low carbon economy and of a more democratic society where all levels of responsibility are interconnected, is it not time to use these objectives to devise local strategies for smart, sustainable and inclusive territories?

On 27 August 2010 in Rimini (IT), José Manuel Barroso asked if there were *other areas than the Covenant of Mayors where Europe could be built from the bottom up.* Yes, Mr President, there are a lot of domains, including the EU 2020 strategy, in which, with the territories and citizens, we can prepare the Europe of the 21st century.

CONTACT : Energy Cities
Stéphane Dupas (coordinateur IMAGINE)
+49 781 919 712 79
stephane.dupas@energy-cities.eu
www.energy-cities.eu/imagine