WED 2005

It is a real pleasure to be here with you. I address cheerful thanks to the organizers for having inviting us to this event.

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1. Lausanne, first Swiss City to receive the award gold

Lausanne is a resolutely forward-looking city which has for many years been actively involved promoting renewable sources of energy and in using energy as efficiently as possible. This applies not only to its own stock of municipal buildings and its own activities, but also through the provision of a range of services to meet the needs of its populations. The people of Lausanne may be rightly proud of their city, which in March 2004 was awarded the European Energy Award gold (EEA) label for its effective management of its energy policy.

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2. What are the European Award Gold and Cités de l'Energie labels?

Municipalities have an important role to play in promoting energy policies. They have significant power in this field, and this is a necessary condition for carrying out the numerous tasks relating to the implementation of these policies in an efficient way.

Faced with energy and environmental management requirements, some communes and urban local authorities have adopted a voluntary policy with ambitious targets and have secured the necessary financial resources to achieve them.

The Swiss "Cité de l'énergie®" label is a tangible sign of recognition for the efforts that have been made by these communes. This award is granted to the communes and cities that meet the necessary conditions. It singles out exemplary local authority energy policies and is also a prominent and visible tool for the continuous dissemination of ideas.

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Good ideas always travel well, so European Union countries including Austria, France, Germany, Ireland, Italy, Lithuania, Poland and Slovakia adopted the concept, which is now known as the European Energy Award®.

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The European Energy Award® is based on a process of continuous improvement and on a catalogue of standard measurements covering six fields of interest. The label rewards communes, small and large alike, for their exemplary achievements in at least three of the following areas: **regional and town planning and buildings, energy networks, water and wastewater treatment, transport, information and organization.**

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1. Conditions that cities and communes must meet in order to receive the award

Cities and communes that are eligible for the label must fulfill the following conditions :

- Submit a detailed report on the energy policy measures that have been implemented, planned or budgeted for on the basis of the label catalogue.

- Have implemented more than 50% of the proposed measures (more than 75% for the gold label). Lausanne has achieved 80%.
- Define targets and set up an energy policy program for the next 3-5 years.
- Budget for the financial resources that will be required to implement the first phase.
- Institutionalize the indicators used to monitor their success in implementing these energy policy measures

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2. Situation at the end of 2004

At the end of 2004, Switzerland had:

- 121 towns and cities which had been awarded the "Cités de l'énergie" label, representing more than 2 million inhabitants

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Lausanne is at the top of the "Cités de l'énergie" ranking, **with 80% of the measures achieved.**

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3. Summary of initiatives in Lausanne

The following slides have been included to show you a few examples of the measures that have been implemented in our city. I will then return to deal with some of these at greater length.

Land management and development

- Insertion of a chapter on "energy savings" and "mobility" into the Communal development master Plan
- Introduction of an "energy aspects" section in all official bulletins
- Implementation of a Local Agenda 21 program
- Establishment of a sustainable development fund
- New general allocation plan (PGA – Plan Général d'Affectation): for the 4th time in its history, Lausanne has carried out a review of its urban planning system. The former plan dated from 1942.

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Municipal buildings

- Energy consumption diagnostics
- Remote management (144 buildings)
- Building rehabilitation projects
- Concept for use of renewable energy
- Potential for use of solar energy in municipal buildings

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Energy supplies

- Development of a district heating system
- Waste-to-energy project : construction of a new 80 MW incineration plant connected to the grid and to the district heating system : Tridel
- Certification of our entire electricity production system
- The solar- and wind-power market
- Provision of services for Utilities customers : energy audits, remote management, contracting (Flon-Ville)
- Wood-fuelled boiler at Tuilière (3 MW) connected to the district heating system

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Mobility and transport

- The M2 metro
- Aquarel solar boats on Lake of Geneva
- "Serpentine", a revolutionary public transport project
- Specially designated parking zones
- Promotion of electric scooters
- Promotion of natural gas-powered vehicles
- Park & Ride facilities
- Around one hundred new pedestrian crossings
- Pédibus (walking bus) concept

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Internal organization

- Creation of a local energy office
- ISO 9001 and ISO 14001 certification

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Communication, cooperation

- Establishment of "Contact énergie", an energy information centre
- Website with links for pedestrians and bike riders
- Active involvement of local stakeholders in the local Agenda 21 process ("quartiers 21" initiative)
- Commitment towards sustainable development (signature of the Aalborg Charter, the Charter of European cities and towns towards sustainability)

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I would now like to give you a few examples relating to regional and town planning.

4. Local Agenda 21

For many years, the city of Lausanne and its Municipal departments have been undertaking projects associated with sustainable development, **which have involved energy, mobility, town planning and even social and educational projects**, although formal links with the latter were never clearly spelt out.

At the end of 1998, the Municipality of Lausanne decided to officially launch a local Agenda 21 process and signed the Aalborg Charter (the Charter of European cities and towns towards sustainability). The charter calls all Municipalities to tackle the imbalances in today's society, the economy and natural resources and to solve the problems by integrating these three areas.

In its final version, **the Lausanne Agenda will be comprised of seven sections** so that the whole range of communal policy areas and the various aspects of sustainable development will be covered. These include:

- Wood, energy, the environment
- Social aspects, housing, participative process,
- Finances
- Training and education
- Mobility and transport
- Economy et security
- Living together

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Another specific aspect of Lausanne's approach is its method of financing and the establishment of a **sustainable development fund**. Initially set up using a sum of 7 million taken from the utility's reserves, the fund's income is now provided by a withdrawal on the profit of water, gas and electricity distribution. This accounts for approx. 2 million per year.

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Lets' now take a few examples relating to the management of communal buildings.

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I will look at 3 measures: energy diagnosis, remote management systems and the use of renewable energy

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5. Energy diagnosis

The city of Lausanne has developed an original energy diagnosis method in collaboration with the Swiss Federal Institute of Technologies, based on monitoring of energy consumption data. This method has been improved over the years through our solid experience in energy management.

Heat and domestic hot water consumption is adjusted taking the climate (external temperature) into consideration over a given period. The measured points are plotted and form a benchmark line that is called the "energy signature".

Each building has its own energy signature. Thanks to this method, a number of towns have been able to drastically reduce their energy consumption over a very short period of time.

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The benefits of the energy signature

The adoption of the energy signature method greatly facilitates energy management in a stock of buildings. It provides an efficient and accurate way of monitoring energy consumption (heating) and improves the understanding of the building's dynamics. The method relies on the principle of continuous improvement and can be used to detect and correct any drift in consumption very rapidly.

It is a dynamic energy optimization method which is very different from the so-called "static" methods which involve carrying out annual energy audits on the basis of static indicators.

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I will give the weekly monitoring of consumption data as a simple example of the application of the energy signature method.

This tool can be used to check whether given set points are being met and can be used to rapidly correct any deviation from these.

The set points are based on a building's energy signature, which indicates the amount of energy that is needed in relation to external temperature.

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6. Remote management

An example of an application of the energy signature methode is remote building management.

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Remote management therefore results in:

- Reduced consumption
- Improved comfort
- Reduced running costs, thanks to remotely controlled systems
- Buildings being monitored on a continuous basis

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This slide shows the graph for a building connected to the district heating system and which has two heating plants and one solar-power installation for pre-heating of domestic hot water.

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For the record, the Lausanne Utilities manage 144 buildings on a remote basis.

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7. The use of renewable energy

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Solar thermal applications

Our project relating to solar thermal use involved studying 2 installations in detail, then determining the solar thermal potential of municipal buildings. Using the experience gained, we were able to optimize the management of these solar installations and use remote monitoring for all of them.

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The study also showed that:

- Installations must be > 23 m^2
- The potential in Lausanne is estimated as being a collector area of 2,300m^2 spread over 41 buildings
- The cost of investment would be 3.5 million CHF
- The average cost of 1 heating kWh is 17 cts

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At the end of 2004, Lausanne has installed 531m² of solar thermal collectors which produce 300 MWh annually.

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Solar photovoltaics

The year 1990 marked the beginning of photovoltaics for Lausanne's Utilities. After some demonstration plants, the objective was to obtain the lowest possible production cost per kWh. This is how the installation at the Pontaise Olympic Stadium came into being, with final production cost of 90 cts / kWh.

The City of Lausanne received both the Swiss Solar Prize and the European Solar Prize for this project.

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The energy department then started to put in practice the concept of architectural integration of PV installations, that is, the identification of those building elements that can be replaced by PV panels without impairing the building's aesthetics.

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The final step : getting the population involved! Hence the idea to develop individual **solar kits** using commercially available components that could be easily installed on a balcony or a terrace.

Known as "EP*SIL*ON", the kit is made up 2 solar panels, a current inverter for a direct connection to the 230 V grid and a multifunction aluminum support. It delivers around 100 W of power and generates close to 120 kWh per year.

The electricity savings fund subsidized 250 of those kits by up to 400 CHF each.

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To end with the photovoltaic saga, let's not forget that the Lausanne Utilities projects were awarded the Swiss Solar Prize in 2002 and 2003.

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A small word on an actual project : the construction of the biggest windmill of Swiss in Collonges, Valais. This last one, with a power of 2 MW, will have a mast of 100 m for a diameter of the rotor of 71 m. It will produce annually 3 ' 500 MWh. As a comparison, the objectives for wind energy of the confederacy for 2010 are understood between 50 ' 000 and 100 ' 000 MWh. The Site of Collonges has a potential of 4 windmills.

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Now let's take a few examples from the field of energy supply.

Firstly I'll consider **the development of a district heating network.**

Developing a district heating network is an efficient way of reducing air pollution in a city.

The use of more environmentally-friendly sources of energy, combined with a reduction in the number of heat-producing installations and the removal of individual chimneys makes a significant contribution to reducing the pollution load.

Energy efficiency can also be increased using CHP (coupled heat power).

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The domestic solid waste incineration plant, incineration of sludge from the wastewater treatment plant and a wood-fuelled boiler have been connected to the district heating system, thus resulting in 28% of the heat being obtained from renewable sources. Our heat production in 2004 was 420 GWh. 90 GWh of electricity is also generated using CHP

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8. A new incineration plant in the city : Tridel

I will now talk about the construction of a new incineration plant to be commissioned in 2006. The plant will burn in the center of Lausanne domestic waste of 45 cities and will provide heat for the district heating system.

It will have a capacity of 140,000 tons and will use the waste that is currently used as landfill. With the new plant, the proportion of renewable energy used for district heating will increase from 28% to more than 50%.

The new plant will have a 80 MW capacity and will produce 200 GWh of heat and 59 GWh of electricity

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Its energy efficiency will be 50%. The graph shows how much of district heating demand will be met by the plant. Excess production in summer will be transformed into electricity.

In financial terms, the project will cost 290 millions CHF.

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9. Energy contracting

A permanent barrier to the introduction of new energy technologies is the high investment cost that they involve despite the fact that this is rapidly repaid by the savings made in operating costs.

This reluctance is reinforced further when the consumers are not the owner-investor but tenants. How can owners be asked to pay additional costs, knowing that they will not be able to pass this on as rent, and when the primary purpose of the investment is to reduce service charges for the tenant?

Energy contracting is the most appropriate solution for solving this dilemma:

> The Lausanne utilities pay the capital investment plus the cost of operating and managing the technical installations. This is the only way to guarantee safe, cost- and energy-efficient services for the customer.

Our Utilities have therefore evolved away from having the status of a utility supplier (electricity, gas, district heating and water) whose responsibilities stopped at the customer's meter to a position of being an energy service provider.

As a quid pro quo for the services offered, the customer will keep the same distributor for the whole duration of the contract. In short:

- The distributor takes charge of the technical installations:
  - Design
  - Financial cost
- The distributor supplies and bills the end-user for an energy service which includes
  - Useful heat for heating (kWh)
  - Domestic hot water (m^3 at 55°)
  - Refrigeration and air-conditioning
- The distributor is responsible for operating and maintaining the installations.

A special relationship is therefore established between the customer and the distributor:

- the customer externalizes the management of their technical installations
- the customer has only one contact
- the result for the customer is improved comfort
- the distributor includes renewable energy in the services they supply
- the distributor optimizes energy management

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The example shown concerns a backpacker's hotel, which has been renovated to meet Minergie standards. The façade was insulated while still ensuring that the historical character of the building was maintained. In addition, a system for remote monitoring of the technical installations was installed, as were 60 m^2 of solar thermal collectors. The project was awarded the Swiss solar prize in 2002.

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Now let's look at mobility and transport.

10. Métro M2

The "M2" is a new underground line to be built on the model of the M14 in Paris. Currently under construction, M2 will have a permanent effect on modal distribution within the urban area by increasing the use of public transport. The construction of park

and ride facilities at the periphery of the urban area, the complete restructuring of the network of public transport lines within city limits, will further reinforce this trend.

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It will carry 27 million passengers per year and connect with an area in which 37'000 people work. It will be the first subway in the world operating on fully automated basis with a 12 average gradient.

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11. Solar boats

The primary aim to these various initiatives is to improve the quality of life to the people living in Lausanne, their originality will make them an asset for the tourist industry. Completing this picture, we run four poetic solar powered boats in our Lake Leman. You would love it.

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12. Pedibus

In Lausanne, Pédibus is a walking bus system which provides 6.5 km of public transport "on foot". It is made up 15 lines, each of which covers an average distance of 435 m with timetables at each terminus and stop.

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The Pédibus concept relies on the neighborhood's capacity for making an individual concern (ensuring the safety of one's child on their way to school) a collective one; that is,ensuring the safety of all the children in a neighborhood on their way to school.

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The Pédibus involves the participation of adults, usually pupils' parents, who offer to accompany the children to school on foot. Children wait for the **Pédibus** at the agreed meeting point and walk with the walking bus to their school.

This concept is safe for the children and is a good way of developing conviviality and solidarity between parents in the same neighborhood.

As you could see, the politic of sustainable development of our City is based on innovation, comprises a wide spectrum of activities in all the fields of our public city life and above all is characterized by a great coherence.

And as my personal final conclusion, I would like to add to this renowned sentence a couple of words of my own :

Think global Yes !

Act local Yes !

But above all, and before it is too late, ACT NOW !

Thank you for your attention !