



with the collaboration of FEDARENE and CLER

European Conference: Energy Education

Opening speech

Michel Vampouille

Vice-president of the Ile-de-France regional council responsible for the environment, sustainable development and the eco-region.

Michel Vampouille, Vice-president of the regional council of Ile-de-France, responsible for the environment, sustainable development and the eco-region, thanked ARENE (Agence régionale de l'environnement et des nouvelles énergies; Regional agency for the environment and new energies) for having organised the event. He gave apologies for the absence of the European Commissioner Piebalgs.

He reminded those present that the Ile-de-France is Europe's leading economic region. With a fifth of the French population, it is also the biggest energy consumer in France. While the economic footprint is the largest here, it is however in this region that energy consumption per inhabitant is the lowest. This phenomenon can be explained by a substantial public transport system, vertical, and therefore denser and more energy efficient, building development, and finally, the large number

of, more efficient, heating networks. Paradoxically therefore the Ile-de-France region poses as a virtuous region while its inhabitants, who are wealthy and consume products that require a lot of energy to be manufactured, are less so.

It is worth noting that France, a country marked by a long tradition of centralisation, has always had the tendency to favour single, large-scale ecological solutions, while having difficulty acknowledging the pertinence of offering a variety of solutions. Yet, ecological issues differ according to the geographic location. Now more than ever, apt questions should be introduced in the political debate. Admittedly energy education runs counter to the cultural habits of the French but it is a major issue for their future.

In recent years we have seen an awareness of energy-related issues emerge. Statistical surveys have shown that recent climate related events, such as the storm of 1999 and the heat wave of 2003, among others, aroused real anxiety and concern about the future of the planet, among the inhabitants of the Ile-de-France, particularly the young. However, these concerns do not prevent paradoxical behaviour, such as the dramatic rise in 4x4 sales in the Ile-de-France. It is worth noting that another factor is acting in favour of environmental concern. That is the sudden rise in oil prices, which is increasing demand in terms of the policy of managing energy and renewable energy development.

In the Ile-de-France region however, it must be recognised that, as far as the population is concerned, resolving energy problems is not the responsibility of the citizens, but of the state or large companies. By way of example, it is striking to note that few of the Ile-de-France municipalities show the cost of the energy used in municipal buildings or transport in their annual financial statement. One of the main issues will therefore consist in making French citizens realise that resolving energy issues depends both on their individual decisions and those of their local authorities.

With regard to energy policy, the Ile-de-France regional council is taking action via the financing of ARENE, of facilities such as regional nature reserves, and via the development of local energy agencies. This last type of infrastructure enables, among other things, objective energy-related information to be disseminated and also appears to play a crucial role with regard to educating architects and those working in construction. In fact, an energy culture should be propagated in all professional sectors.

Essentially, it must be noted that it is advisable to raise awareness and to give a sense of responsibility without giving a sense of guilt. Everyone should be made aware that they can contribute toward the overall reduction of energy consumption, without however being given the illusion that a sum of small acts will save the Earth, since because these must be supported by major political decisions.

The combination of energy and sustainable development policies should no longer seem incompatible. Global, deep and systemic reflection should be initiated while not forgetting that sustainable development will not be able to emerge through the simple addition of environmental policies.

Michèle Pappalardo,
Chairwoman of ADEME

Michèle Pappalardo, Chairwoman of ADEME (Agence de l'Environnement de la Maîtrise de l'Energie; Environment and energy management agency), reminded those present that the energy issue is a central subject for her organisation. She therefore welcomed a conference dealing with the topic of energy education, which will enable the subject to be touched on in a concrete and operational way and theoretical discourse on sustainable development to emerge. Moreover, it seems that the European dimension of this event should allow basic experiences to be shared.

Energy education is a major issue because French citizens remain little informed on the subject, full of generally accepted and a priori ideas. As much on the level of supply as demand, knowledge on the subject is vague. Thus, as regards the production of electricity, few French are aware of the fact that coal is still the main resource used. Many obstacles, fed by deep-rooted prejudices, are also preventing the development of wind energy in France. With regard to consumption, the French, for example, cite nuclear energy as one of the causes for climate change but do not think of heating! The production of biofuels is also an issue; while it enables relative energy gain in France, the conditions under which it is manufactured in the United States do not.

Currently, the main issue is to give the citizens the tools and information required to make informed decisions. Michèle Pappalardo thinks that the French must be capable of appreciating the significance of the various options with regard to the reduction of energy consumption. Energy education, in particular via learning a certain number of basic ideas at school, seems crucial.

From this perspective, ADEME, which does not have an explicit educational mandate, seizes any opportunity that arises. It works in partnership at all levels and with state education in particular. In this way, ADEME has financed, with INES (Institut National de l'Energie Solaire; National institute for solar energy), teacher training and regional education authority resources on renewable energies. ADEME is also working on the creation of national teaching aids, including e-learning tools. These aids are also available in a variety of forms and are adapted according to the local context. ADEME also plays a part in schools. The organisation also carries out significant work with environment conservation and community education associations, which are very involved in these issues. Furthermore, ADEME assists local authorities in their progressive commitment to these topics. In particular, ADEME promotes the construction of schools using HQE (Haute Qualite Environnementale), the French sustainable building standard, which demonstrates the use of renewable energies in concrete terms.

Finally, ADEME is pleading for the launch of larger scale campaigns on energy savings, and their publication in children's magazines. In reality a maximum amount of information must be made available to the population.

Luc Blanckaert, moderator thanked the speakers for their practical opening speeches, which clearly prepare the ground for what an energy education project can be. In this way, it is advisable to raise awareness and give information, without however increasing anxiety. False ideas also need to be combated, the most rational knowledge possible disseminated and education in responsible behaviour given. The main concern will be to make sure that French citizens are able to judge for themselves and, thus, make the right choices.

Workshop no. 1 on teaching aids

Moderator :

Raphaël Claustre, CLER (Comité de Liaison Energies Renouvelables

Rapporteur :

Hans GULLIKSSON, South East Sweden

Rolf Behringer, ISES International

Cédric Carles, ADER (Association pour le Développement des Energies Renouvelables; Association for the development of renewable energies))

René Cornand, ADEME

Marianne Duffet, Vivacités Ile-de-France

Cédric Jeanneret, Terrawatt

Philippe Levy, AJENA (Association Jurassienne pour la diffusion des Energies Alternatives; Jura association for the distribution of alternative energy)

Raphaël Claustre reminded those present that workshop no. 1 concerned energy education teaching aids, which came into being about fifteen years ago. With the emergence of the issue of energy consumption, however, these aids are multiplying and becoming more and more visible. Raphaël Claustre explained that the exchanges will aim to clarify the contribution and value of the aids concerned and to outline the limits of these teaching aids. The subject must also be tackled from the point of view of communication, as it is true that the distribution of the aids largely depends on this.

Marianne Duffet began by presenting Vivacités Ile-de-France, an Ile-de-France urban environmental education network that is facilitated by volunteers and people working in education, activities, tourism and mediation who share their teaching methods. The network offers training courses and teaching aids and a resource centre is also due to open soon.

Marianne Duffet explained that Vivacités Ile-de-France, in partnership with ARENE Ile-de-France, has created the game *Citénergie*, which is aimed at a primary school public of children aged between eight and twelve years old. It is possible to play in large groups, in two-hour sessions or over several days, as part of an actual teaching programme. Preparation time will be necessary in both cases. The game aims for energy awareness and the appropriateness of eco-actions, raising children's awareness to the issues of energy management and learning about different forms of energy in the city.

In a more practical way, the activity places the children in a city presenting the issue of depleting resources and of pollution. The game will make them discover imaginary cities using various energy sources. Each landscape will present a different energy complication and set of urban issues, with various modes of consumption and transport. Four fundamental requirements will be underlined: consumption and installations, transport, lighting and heating. Each team will have a logbook showing the issues and responses to the energy issue. As each issue is resolved, a report card showing the advantages and drawbacks of each mode of energy will be given to the team. The final discussion will give rise to a concerted decision solving the issue of the city that the game started with. It is a cooperative game, which does not place the players in competition and which moreover is carried out according to an approach that does not induce feelings of guilt. The game

master, Illuminix, must facilitate the session and make it dynamic. Finally, a teachers' guide will suggest subsequent activities for possible additional sessions.

The two-hour format is more suited to specific use in a recreation centre. However it is strongly advised to plan an introductory session to introduce the basic vocabulary. It will also be possible to incorporate the game in an actual teaching programme and thus to use it over four or five sessions with numerous subsequent activities being conceivable.

It is worth noting that the game can be photocopied in its entirety and therefore retained by the player at the end of the activity. The various elements of the game can moreover be displayed on boards. *Citénergie* can be used as much in a school environment as in an extracurricular environment. It can serve as a starting point to a larger project or can be an opportunity to check children's knowledge of energy.

Marianne Duffet clarified that in 2007, Vivacités Ile-de-France will organise training courses for coordinators of associations, supported by ARENE and the Direction régionale et départementale de la jeunesse et des sports (Regional and departmental directorate for youth and sports). These sessions will provide the opportunity to distribute the game throughout the Ile-de-France region and to promote the development of teaching programmes on this subject. Teachers will find this game in teaching and environment resource centres and in the CRDPs (Centre régionale de documentation pédagogique; regional teachers' resource centre). Finally, the game will be available and downloadable on line in 2007.

Raphaël Claustre asked Marianne Duffet how Vivacités Ile-de-France counts on ensuring that the game is really effectively distributed.

Marianne Duffet explained that in addition to making the game available on line on the ARENE website, a kit will be made available in every CDDP (Centre départementale de documentation pédagogique; departmental teachers' resource centre). She added that the state education quality mark is in the process of being obtained, which will ensure wider visibility of the game for those working in education. In December 2006, Vivacités Ile-de-France will also be organising a workshop on teaching aids and will present the game on that occasion. Finally, free training courses will be offered to community education trainers.

André Candio, of Nature et Société Association, wanted to know if it has been possible to devise a behaviour assessment of the game's users. In fact, while it is positive to carry out awareness raising activities, it is even more necessary that they then find their concrete expression in the individuals' change of behaviour. André Candio also suggested that the game rely on a starting point based on the fundamental needs of the individual, which will structure the thought process according to a more comprehensive picture.

Marianne Duffet replied that the game is based on the needs of the age groups concerned. She added that above all else it aims to get the children to ask questions and to raise their awareness.

Raphaël Claustre asked Marianne Duffet if work on energy presents particular problems for teachers.

Marianne Duffet explained that teachers with whom the game had already been tested were already aware of the issue of energy consumption management. Despite this, it is not simple to popularise information in the field of energy. It is in fact a complex discipline, which requires time to be acquired, researched, and for considerable preparation.

Philippe Levy reiterated that the Franco-Swiss project EDEN (EDucation à l'ENergie; Energy education) started two years ago. It has led to the development of a strong partnership between the French and Swiss facilities involved.

Cédric Carles clarified that AJENA and ADER are joint owners of the project. It involves raising the general public's awareness of energy issues at various events. Within the scope of EDEN, various associations pooled their expertise to design new tools and develop and perfect those that already existed. It is worth noting that the multiplicity of the existing tools in the field of energy education is not always proof of their quality.

The project took shape in a border region. A Franco-Swiss Internet portal, the medium of an educational campaign, was created. The campaign consists of activities in schools located on either side of the border, of twinnings and events such as energy fairs, as well as opportunities to tackle energy issues, loaded with constraints and ethical rules, more positively. Moreover, EDEN aims to catalogue the existing French language resources and to perfect them, while benefiting from the sharing of knowledge and expertise.

Cédric Carles explained that the renewable energy demonstration van is in some ways a mobile exhibition platform, a concrete manifestation of the EDEN project dealing with energy issues. The van runs on biofuel, is energy self-sufficient and equipped with a wind turbine and thermal and photovoltaic solar panels. The Internet portal, a progressive tool, provides teachers with assistance in teaching energy issues. Moreover, a work group regularly checks the contributions broadcast via this site.

Cédric Jeanneret explained that the Terrawatt association is primarily aimed at creating a common language between building managers, particularly of schools, and their users. The *défi énergie*, energy challenge, offered by Terrawatt, is a tool to be used by local authorities wanting to communicate with the users of school buildings on the energy performance of the premises. It is also suggested to the local authorities that concrete energy savings are made. It is a civic approach aimed at making pupils change from passive consumers to responsible players.

The *défi énergie* project lends distinction to school courses. It unfolds in three stages: learning about energy and its issues, with a focus on energy conversion chains during a forest walk; an activity explaining where energy comes from, through a visit to the school's plant room for example; a session aimed at showing the opportunities for energy savings which will enable the formulation of practical energy saving proposals to be made to the owners of the buildings.

The *défi énergie* project requires at least three contributions from the facilitators, specific training for the teachers with the help of, among others, a reference teaching folder and discussions between the Swiss and French classes within the framework of EDEN.

Cédric Jeanneret added that EDEN has also enabled a board game to be created. The pupils are invited to discover the superpowers of the Enermen, such as Aquaman and Gazman. The player has to find a way of optimising their performance. The game enables individual and global approaches to be combined, with every energy chain and individual decision having a more global impact. The game is available on subscription. EDEN is offering 50 games for 1,000 euros until the end of September 2006.

Cédric Carles clarified that the EDEN network has also entered into partnership with the media, such as the television channel *France 3 Bourgogne/Franche Comté*, to broadcast cartoons, a mass entertainment medium, which raises children's awareness of energy and the environment.

Cédric Jeanneret added that following the success of the EDEN campaign, the associations involved would like to widen their network and formally appeal to the participants of the European conference.

Raphaël Claustre asked how the caravan is financed.

Cédric Carles indicated that the EDEN campaign is co-financed by the INTERREG programme. Facilities, such as schools via local authorities, trade shows or festivals, also contribute to the financing of this tool. Cédric Carles underlined the fact that the activities of the network's associations are significant events in school life, for which reason the pupils' parents sometimes provide financing.

Hubert Jaeger, teacher of the Académie de Strasbourg, a regional education authority, asked which organisation made the investment needed to produce the van. He also wondered about the financing of the running costs. Finally, he asked if there are glaring differences between energy education in Switzerland and France.

Cédric Carles explained that the associations involved have very limited operating budgets. In reality, the operation is incorporated in the invoiced travel cost. Cédric Carles added that energy education is already fully incorporated in the German-speaking Swiss curricula.

Cédric Jeanneret added that in Switzerland, every canton manages its own state education issues. He also underlined the role of the associations in bringing together the cantonal authorities responsible for education, the environment and territory. The associations thus contribute toward the creation of a common language between two departments of the state.

Raphaël Claustre asked what type of biofuel is used to fuel the caravan.

Cédric Carles replied that the association uses rapeseed biodiesel, a product manufactured near Lausanne by an agricultural cooperative. This fuel is legal, taxed by the federal fuel oil agency and sold in petrol pumps.

Rolf BEHRINGER spoke about the Solar Schools Forum which was a study which lasted for 13 months and which concluded in June this year. He then discussed a mobile teaching unit which is in operation.

On the first topic, there were several countries involved. The main function of the project was to report in the use and introduction of renewable energy and energy efficiency in schools. The situation was assessed in each country regarding renewable energy in schools. Having seen what each country was doing, an informative multilingual website – www.schools4energy.net – was then set up so that everybody could learn what options were available to them to improve in this area. Mr BEHRINGER believes that this is a very useful website and everybody is invited to visit the site and provide us with information and feedback.

At the beginning, the solar trailer was also a transporter with a diesel engine. The engine was quite expensive so it was decided that it would be more profitable for it to be made by ISES. There is now cooperation from the city of Fribourg with ISES France.

Before the rain came this summer, there were some very hot days, and during that time, a contract was in place with the city of Fribourg where schools could order the trailer and the city of Fribourg paid for it.

.1 Demonstrations

Mr BEHRINGER explained that there are some useful tools to show the students and schools the uses of solar energy such as CD players and a solar oven. They also display the power of the sun by using a satellite dish with a reflecting point which can then burn a piece of wood. The students are generally fascinated with these displays and demonstrations. One part of this concept is that the groups are responsible for one of the stations and they learn what is involved and explain it to their classmates at the end. They were very proud to do this.

In Fribourg, there is a very good situation because almost 50% of the schools have roof-top solar panels and they actually earn money from the electricity which they produce. They now have a tracking system that follows the sun and they can compare the results of fixed panels versus the moving tracking system.

The trailer is always accompanied by a professional person who knows exactly what is involved and is able to deliver the programme to the people who hire the trailer. It is very useful for travelling to places to demonstrate to schools the real benefits and possibilities for solar energy – not just for small things, but for large-scale uses also.

André Candio was afraid that what had been carried out in Fribourg could not be done in France. In his opinion the French are in the habit of setting written learning against practical learning. Yet the experience offered by ISES International is supported by practical activities. Few French schools seem equipped to implement such a programme. André Candio also noted that in France, discussions between pupils are less encouraged as the teacher is supposed to hold supreme knowledge. He added that it would be highly desirable in France for the world of education to strengthen its ties with that of business.

Mr BEHRINGER responded by saying that the first part of the question is the very reason for a mobile solar road show; individual schools could not afford to buy the material themselves. The other thing is that ISES have corporate sponsors for their activities.

Cédric Jeanneret announced that he was satisfied with regard to the emergence of a wide range of tools. He underlined the importance of ensuring that they are distributed effectively.

René Cornand explained that the SILAE project (Service d'initiative locale en Amazonie équatorienne; Local initiative service in the Ecuadorian Amazon) is financed by the European Commission within the @lis programme (Alliance for the Information Society). SILAE is based on four founding principles: sustainable development; decentralised rural electrification (photovoltaic or wind); local governance; and support of the Amazon basin and all of its communities. SILAE is integrated in the field of new information and communication technologies in order to promote local initiatives through small participative projects in the field of energy and electrification. It also aims at the development of cooperation between European and Amazonian communities.

SILAE is a parity project. Many European and Amazonian partners are participating in the programme. The campaign costs 2,650,000 of euros, 80% subsidised by the European Union. The project involves the mobilisation of international experts and is coordinated by ADEME.

SILAE is a three-year feasibility programme aiming to facilitate access to the three regions of Ecuadorian Amazon, to promote the production and sale of electricity and to strengthen partnerships between the Ecuadorian authorities and Amerindian communities.

The general objectives of the project are the following: to accommodate domestic use in rural areas; to strengthen local governance; to encourage local initiative and the development of ICTs; to set up an Internet network; and to encourage local players to participate in decisions relating to the design of the project.

Of the operational objectives, the following should be mentioned: the connection of 20,000 homes to electricity in 2007; the setting up of 20 locally managed rural electrification companies and of Internet points; and the generation of 20 million euros of investment from European companies.

The expectations of the population vary. They really desire a change of lifestyle and would like to see economic development and new employment conditions emerge.

In support of the project a teaching programme was set up aiming to assess the social perception of SILAE through the pupils. A painting and story competition was also launched. This project enabled direct contact with a large majority of the Amerindian communities to be made, the project to be promoted to primary and secondary school pupils and gave rise to the participation of local players in SILAE. The competition enabled pupils to appropriate the subject of energy.

In the end four provinces out of six played the game. The competition enabled pupils to illustrate the change of lifestyle expected after acquiring electricity, to affirm their strong cultural values and to express their expectations with regard to the improvement in their school environment and to Internet access. Prizes and certificates were awarded to the competition participants.

By way of conclusion, René Cornand drew the participants' attention to the big @lis Day event, being held in the near future at the Ecole Polytechnique (engineering school), on the subject of biodiversity in the Amazon. This event, broadcast live in its entirety on the website, will be the opportunity to present the SILAE project.

Raphaël Claustre asked about the method of incorporating the environmental issue in a community that does not have access to electricity.

René Cornand clarified that in Ecuador, the populations are faced with the power of the oil companies, which supply material free of charge to the communities. SILAE, while proposing photovoltaic equipment, is attempting to offer a service that corresponds with these populations' needs which are much more modest than those of Europeans.

Workshop no. 2: Cooperation between the worlds of energy and education

Coordinator:

Marcello Antinucci, AESS Modena

Reporter:

Maria Louisa Borra Marcos, Andalucia

Speakers:

Christiane Egger, ESV, Upper Austria regional energy agency

Hélène Sanchez, ARENE Ile-de-France

Janus Hendrichsen, ESEEF

Johann Vacandare, Quercy Energies

Marcello Antinucci indicated that he works as Director of the Modena Energy Agency. In his opinion, the following problems exist:

- competition between the teaching aids;
- difficulty in arousing lasting interest of the teachers;
- issue of the consistency of the political message and practice, particularly from the point of view of the quality of the installations.

The Modena Energy Agency tries to create stable partnerships and even hopes to make the aids implemented constitutional. Success is only possible if the activities are driven by several people successively.

Christiane EGGER explained that Upper Austria is a very industrialised region that is also strong in the service sector, tourism and agriculture. Ms EGGER works with the regional Energy Agency of Upper Austria (ESV) and everything they do is based on the regional energy action plan. In the first phase of this plan in the 1990s ESV increased the share of renewable energy from 25% to more than 30%, half of which comes from hydro energy and the other half from biomass, which is wood and solar. They are also active in energy efficiency and there is a Government commitment to increase energy efficiency by 1% every year for the next six years.

The organisation ESV has had some very mixed experiences working with educational projects. They have had bad experiences when what they wanted to do met with complete disinterest. This was mainly due to a lack of understanding and working rhythm between energy agencies and educational bodies.

.1 Eco Energy Engineers

Some time ago, the ESV realised that they would need more engineers who knew about renewables. They have just had their first graduates in this during the summer and all 230 graduates have found a job. This was a difficult process as there was a lot of bureaucracy to overcome. The ESV also had to convince the universities themselves of the value of this, as well as the Ministries in Vienna

who are in charge of the programmes overall. Energy companies participated very actively in the development of the curriculum as it was difficult for the universities to know what the course should comprise.

The energy companies were involved from the very beginning and did a lot of promotional work to attract students. The ESV also held some of the courses within the energy agency, alongside the university courses. They then helped trainees find places and the energy world is now hiring the first graduates.

.2 Eco Energy Plumbers

The vocational training for plumbers and installers was possibly more important than the training for engineers. This is a problem all over Europe and a barrier to the market because people are reluctant to use new technologies and do not always have a high level of education. In Austria, a 16 year old can choose to continue at school or leave to become an apprentice. Together with regional schools for installers, who were also aware of the problem, the ESV overcame the substantial bureaucratic barriers to develop a curriculum. Their own knowledge here was more limited than for engineers and they therefore involved competent installers in deciding what the curriculum should cover. Schools, businesses, the relevant authorities and the agency all worked closely together.

.3 Renewable Energy Tools

The renewable energy tools project was carried out in four regions in Europe. In each region, 10 schools built a working renewable energy installation. For example, one small primary school wanted to build a 9 kW photovoltaic (PV). However, after receiving public funding, they still needed EUR30,000. There were no businesses locally to contribute to this and the school and local associations worked amazingly hard to raise the money. There was a close link between the school, ESV and the local community in making it all happen.

.4 A Local Energy Strategy

The small town of Perg had already developed an energy strategy in the early 1990s, which involved the local students. To update the strategy, students collected data on the household energy consumption. This was also useful in publicising what they were doing. Four schools took part, with the objective of creating a database on household energy and increasing awareness. One school distributed the questionnaires house-to-house; the technical school created an Internet tool for completion online, as well as doing the data analysis of the results; another school did the economic calculations, looking at the economic impacts; with the fourth school doing the awareness raising.

This was challenging as these were big schools, but the end result was very interesting because the students realised that they could contribute something as citizens. There was also a close cooperation with businesses and the local council, who gave a small amount of money to the project.

.5 Kids4Energy

Kids4Energy was a tool that ESV developed for primary school students. ESV had a set of cards showing four families with different lifestyles so that the children would understand that there was a connection between lifestyle and energy consumption.

There is strong competition for the attention of schools and it is a big challenge to break into this world with your own project. Schools are inundated with leaflets regarding all sorts of issues and the normal channels of information will not usually be effective. Getting the attention of schools is probably the biggest constraint of all.

Another challenge is for the schools to make projects their own project. If this does not happen, you will never get the kind of dynamic that often arises. When a dynamic arises in a school, the things that can be done can be amazing.

Timing is also crucial. There is no point approaching schools at the end of the school year, for example.

Some money can help too, as schools often have very little money. A small amount of money, which will get you little elsewhere, can sometimes help schools a lot.

Actually doing something for students is helpful and materials provided should be easy to use. It is also better to work in cooperation with others.

Marcello Antinucci thought that the energy experts must confine themselves to their area of expertise.

Hélène Sanchez is responsible for environmental education at the Regional agency for the environment and new energies, created in 1994 by the Ile-de-France regional council. ARENE Ile-de-France is a centre of expertise and resources on the subject of sustainable development. For several years it has driven an active regional policy of raising awareness and environmental education. It assists local authorities and associations wanting to carry out experimental and reproducible environmental education projects. Our practical approach enables us to become well acquainted with the players and to identify their needs. ARENE coordinates the network of 340 Ile-de-France resource centres: environment centres, educational farms, nature reserves and others. It assesses and promotes environmental education with institutional partners, including DRDJS (Direction régionale et départementale de la jeunesse et des sports; Regional and departmental directorate for youth and sports), DIREN (Direction régionale de l'environnement; Regional department for the environment), ADEME, the Seine Normandy water agency, the national Gendarmerie, the Bergerie nationale (an agricultural research centre), etc. and regional networks of associations such as GRAINE and VIVACITES.

ARENE advises the project owners and helps them in their research by promoting exchanges between the resource centres, local authorities and any player in the environmental field. It assists local authorities in their projects to create educational facilities (for example, environment centres, educational farms, etc.) as well as project owners searching for tools and partners.

ARENE identifies the needs of the facilitators with regard to raising awareness, environmental education and in the specific case of energy.

To this end, we asked the *Bérgerie nationale* and *GRAINE* to carry out a survey of the region's environmental education facilities and educational farms, which showed that 35 to 40% of the respondents tackle the subjects of energy, transport and air in their activities.

We have selected a few of ARENE's campaigns and tools:

- The game *Citénergie*, targeted at children from 8 to 12 years old; which has the aim of raising their awareness of the issues of energy management by making them learn about the various energies and eco-actions so that they can take them on board. The prototype of the game was tested in primary schools and in various recreation centres, social centres and the region's games library, in order to make the necessary improvements. In 2007, ARENE, in partnership with DRDJS and Vivacités, will launch a series of eight workshops on the game for facilitators.
- The index of Ile-de-France resource centres and teaching aids was created with DIREN, DRDJS, the Seine Normandy water agency and ADEME to help facilitators and teachers in their research. It shows 340 resource centres and 118 teaching tools and is updated annually by ARENE.
- Mobile exhibitions on renewable energies or clean transport are free and sent to local authorities, resource centres and schools; they have been very successful.
- Films on energy and renewable energies are provided by ARENE's multimedia library; they can be borrowed free of charge.
- The campaign to raise awareness of energy consumption driven at the Jean Perrin de St-Ouen-l'Aumône upper-level secondary school enabled ARENE to carry out an energy diagnosis and to carry out awareness raising activities for one week.
- The network *Partenaires pour l'ecomobilité* (partners for eco-transport) brings together 49 regional authorities and associations, a total of 100 people committed to eco-transport for education-related travel.

In conclusion, raising awareness and educating are essential requirements for changing behaviour with regard to energy consumption, transport and any other environmental area.

Marcello Antinucci emphasised the significance of this role as a network management centre.

Janus HENDRICHSEN is from the educational world and has been involved in cooperation between the energy world and the educational world for the last six years. Mr HENDRICHSEN has managed different projects, one of which trained young people to identify their own consumption in relation to CO2 emissions. He is currently managing the Schools Energy Forum Denmark, which deals with educational efforts in the energy field in Denmark. Mr HENDRICHSEN explained how he ended up teaching energy because he was able to get hold of free material on energy. He is also doing project management on the energy habits of teenagers and the development of a tool where they can play at being the energy adviser at their own school.

About 1,300 out of 2,000 Danish schools are connected to the Schools Energy Forum Denmark, with 10 regional offices in the energy service. The Forum provides support, hands-on kits and energy advice. They also provide part-funding for projects. Everything that the Forum offers is available via the website, which they find useful as schools really like using the Internet now.

Mr HENDRICHSEN told how he believes that there are a lot of good materials and activities available in Europe that could be replicated by others, including knowledge sharing places. Sharing is therefore possible, although it is not necessarily happening. Countries that are successful have national educational networks. Teachers need help as energy is one of countless subjects in school. Organisations like the Schools Energy Forum Denmark therefore have to focus on energy and pass what they know on to teachers. If this is not done, what the Forum offers will never get into schools.

Mr HENDRICHSEN explained that in most countries, energy is part of the curriculum. It is difficult to influence the content of the curriculum, but if it can be done, it is crucial to success. People who are successful in getting into the classrooms are those who fill gaps. You have to identify these gaps and needs by trying different things and looking at what was and was not successful in projects. This is like market research. If you actually want to provide something that is additional to the curriculum, it must be sold very intensively and there needs to be much more prioritisation of the dissemination activities. Direct mailing and direct contact is crucial here.

Projects that are not successful are those that forget the needs of the teachers. Some projects will work during the project phase, but after the project has been run, they are lost. Projects that take place within a sustainable body will themselves be sustainable. However, if a project takes place with a partner who has no relevant contacts in advance of the project, they will have to spend a lot of time establishing the right contacts and when the project ends, it will be the end for them too.

Mr HENDRICHSEN went on to say that if a project requires you to go to the school and do some things away from the school, you cannot depend on things being sustained by the teacher, whose attention will be drawn to other things.

The European Network of Educational Partners was established in 2000. It is a loose network, with members in more than 24 countries, 20 of which are European Union (EU) countries. Their website provides a lot of materials, which are available in 10 languages. The website was updated from 2004 to 2006 and now contains a lot of useful information.

Education is a rapidly growing market. This is a 'PISA' era. Developed countries, globalisation and PISA combine to make the developed countries compete on educational performance indicators.

Many players in the energy business have a lot of good knowledge. However, they lack the didactics and do not know how to teach. They are also unaware of how the textbook system works. They see themselves as being perfect and that teachers will simply take things from them. This is not the case.

Teachers feel haunted by Non-Governmental Organisations (NGOs) and companies, who want them to promote their own special causes. Additionally, educational systems dry out. Money goes in for IT and teacher training, but materials go out of date. A market is therefore established, but somehow quality does not follow.

Schools can receive more than 100 offers of free material in a single month and if you want to get through to schools, you really have to have a contact teacher. We also need to have quality assurance of educational materials.

Mr HENDRICHSEN explained how the forum is currently working on promoting educational aspects both in schools and at the policy level. This work will look at how you can get your

material into the classroom and will share knowledge regarding how to get access to the full educational system, as well as looking at barriers. There will also be support for cross-border activity.

Johann Vacandarre presented a local project that has been driven in the *département* of Lot, an administrative division of France, by Quercy Energies for the past 15 years and is called *Le pari contre l'effet de serre*.

The network FLAME is made up of some fifteen Local Energy Agencies in France. Quercy Energies is currently the only local agency in the Midi-Pyrénées, in a rural *département* with a population of approximately 160,000.

The *mégawatt* project originates from the overall logic of energy management and the promotion of renewable energies. In a growing energy market with increasing needs such as production, Quercy Energies illustrates energy conservation, efficiency and renewable energies to teachers.

The agency's activity responds to four objectives.

Development of energy education in the education system

The problem of financing arises, which, for schools, is the responsibility of the municipalities. The market being saturated, Quercy Energie focused its work on lower secondary schools, for which there is less teaching material available.

Involvement of private, public and semi-public partners in energy education

It is a matter of enabling the involvement of every player

Development of teachers' competence with regard to energy

Quercy Energie provides resources in its area of expertise, energy, without however going into educational considerations, which are outside its remit.

Raising awareness of and reducing greenhouse gas emissions

This activity has been driven on the model of the European programme developed in 2000-2001 in about fifteen countries. The emissions reduction targets concern the pupils and schools as a whole.

The project was initiated by the distribution of a leaflet. Work was carried out with the teachers and also with the school inspectorate, which validated the project and then distributed it to all of the schools.

Le Pari contre l'effet de serre tackles five subjects and provides a CO₂ savings 'chequebook', enabling an inventory to be carried out at the end of the project.

A total of 17 lower secondary schools and 1,020 pupils have taken part in this project, with strong involvement from the departmental council, which was however hesitant about launching the project.

In response to the first objective, an educational document has been created and will be sent to the teachers every year in order to ensure long-term continuity of the project. The second objective was fulfilled by the involvement of the Syndicat Départemental d'Élimination des déchets (Departmental syndicate for waste disposal), associations and regional agencies such as COPRAE (Conseil Permanent Régional des Associations d'Environnement ; Permanent regional council of environmental associations) and ARPE (Agence Régionale Pour l'Environnement de Midi-Pyrénées; Regional agency for the environment of the Midi-Pyrenees), the Lot environmental education network, community arts centres, town councils and multimedia libraries. With regard to the third objective, a partnership was established with CRDP and specific advice given to teachers. Finally, the fourth objective led to diagnostics of all of the lower secondary schools in the *département* being carried out, to the development of energy information rooms and to the distribution of the 'chequebooks' throughout the department.

Debates

Marcello Antinucci indicated that due to time only two questions could be asked.

Emmanuel Jeanjean, member of Rhônalpénergie, remarked that few people from the state education system were present. He emphasised the importance of working in the long-term on educational content and simple methodologies.

Thomas Dutronic asked about extending awareness raising activities to everyone. He regretted the low number of teachers in the workshop. He also emphasised the heterogeneity of the 'world of energy' and he agreed with Mr Hendrichsen's remarks with regard to the market.

Janus HENDRICHSEN stated that if the answer to the question was known, a lot of money would not have been wasted on projects that did not go through. There is a lack of knowledge from outside commerce regarding the needs. He stated that you need to accept that integration into school systems will take up to three or four years after the project has been run. You are asked to document the number of CO2 emissions that you have reduced. That is very difficult to do. You have to get back to the needs of the teacher. If you meet the needs of the teacher and he sees you as a quality assured provider, he might then go back to you. You have to supply quality materials.

Christiane EGGER said that they approach it from the other direction and look at what it is that the market needs from the schools. In that way, businesses have an interest in the schools. With that dynamic, you are then able to produce things like the two new curricula that she had spoken about earlier. With businesses behind you, you can talk to the Ministries about changing the curricula and schools feel that they can also contribute to local life and business life. Students want this type of perspective, and if you can show them that it is there, the lack of information can be overcome.

In closing, Marcello ANTINUCCI stated that as energy experts, they have to supply the expertise. However, he also said that they should be careful that they do not superimpose their role on others. He expressed the need to look carefully at what is already available before starting new ideas.

Plenary session: report on workshops 1 and 2 and debate

Luc Blanckaert introduced the plenary session by welcoming the fullness and richness of the workshops. He suggested the participants listen to the summary made by the reporters.

Hans GULLIKSON from South East Sweden agency presented a synopsis of the speakers from the plenary session. He explained that Marianne DUFFET spoke about tools and guides for different groups within schools, mainly for younger children, so as raise awareness. They also developed a training programme which mainly took the form of games for the children.

Cédric CARLES, from ADER, who have been working for many years with the education system on the topic of energy was the next speaker. They have developed and enhanced tools for energy in education, regularly checking them for quality. They also have an Internet portal.

The work that is done in Geneva makes concrete working tools to make energy savings, together with the teachers and the pupils. This is a very interesting way to work for the teachers. Children are brought to the forest and taught about energy from fire. Cartoons are also used as a method of teaching energy to the schools.

Mr GULLIKSON then gave an account of a presentation by Rolf BEHRINGER from ISES International in Fribourg in Germany. They have an EU project called Solar Schools Forum, the results of which are on their website www.schools4energy.net. Rolf also talked about model solar workshop, where he went out to schools and conducted different experiments, such as heating, solar cooking, firewood and lenses. The students found this very interesting. Teacher-training is also provided.

Another issue which was discussed and which was different from the others, was how to increase the electricity supply locally. 50 projects from six regions were conducted. Part of the project was social development together with schools.

Edgard Bossoken, manager of the Nord-Pas-de-Calais regional council energy unit, explained that the workshop for which he was the reporter concerned the theme of cooperation between the world of energy and that of education. He indicated that, by way of introduction, the crucial role of energy agencies in the development of tools was emphasised. It is worth noting that often the abundance of these tools generates counterproductive competition. Moreover they do not always match the teaching programme that the teachers would like to implement. Hence the need to create stable partnerships between the worlds of education and energy and to monitor the tools, which should be related to daily life.

Edgard Bossoken explained the remarks made by Christiane Egger, of the Upper Austrian ESV, during the workshop. Christiane Egger estimated the number of teachers at the workshop at 10%, which seems low in relation to the proportion of representatives from the world of energy. Christiane Egger firstly drew the attention of those present to the ignorance that marks the relationships between the worlds of education and energy. She added however that a partnership had emerged in Upper Austria between these two worlds. An eco-energy engineer training course has been set up; this course seems to meet demand. An apprenticeship programme has also been implemented to strengthen the abilities of those working in the field of construction. Renewable energy schools, with energy saving installations, have also come into being. Other initiatives have been launched such as the distribution of articles written by pupils on energy consumption with the aim of arousing the population's interest. Fun tools have also been created.

Edgard Bossoken clarified that Christiane Egger concluded by indicating that competition between schools and the appropriation of the project by the pupils constitute one of the keys to success of such campaigns.

Hélène Sanchez, of ARENE Ile-de-France, also gave a talk and presented the environmental education project that she is facilitating. It is based on a network of 340 resource centres in Ile-de-France and aims to promote actions in the field. Within this context, a survey was carried out with the aim of identifying needs and concluded that teaching aids needed to be developed and teacher training provided. Among the tools deployed by ARENE there is a game, a website, an index of Ile-de-France educational resource centres, free mobile exhibitions, a multimedia library, awareness raising campaigns such as energy audits and finally, the setting up of a network of partners from schools to universities. For Hélène Sanchez, raising awareness and educating are needed above all else to change behaviour.

Janus Hendrichsen, of the ESEEF, explained the energy education being carried out in Denmark and Europe. He emphasised the need to prepare teachers in this subject. He also emphasised the need to identify a niche in which energy education could be incorporated, to support teaching programmes, which is difficult to modify once established. Environmental education and the curricula should also be made to complement each other and the durability and continuity of the projects ensured. Janus Hendrichsen emphasised the need to invest in energy education in a growing market. In fact, despite the abundance of material, it must be recognised that the tools offered are not always sufficiently educational or innovative. It should not be forgotten that they must be able to counter the competition they are up against and to hold the interest of the teachers who are very much in demand.

Johan Vancandarre from Quercy Energies, then presented the *mégawatt* project, which aims to promote energy conservation, efficiency and renewable energies. Thus the project *Pari contre l'effet de serre* was set up in Quercy, involving 17 lower secondary schools and 1,200 pupils, the aim of which is to expand energy education in the educational world, to involve private, public and semi-public partners, to strengthen the competence of teachers in the subject, and to raise awareness of the reduction of greenhouse gas emissions. The target set is to reduce greenhouse gas emissions by 8% in eight months in the schools involved in the campaign.

Emmanuel Jeanjean of Rhônealpennergie emphasised the fact that the educational world should be concerned and take possession of the subject of energy.

In conclusion, Edgard Bossoken reiterated the main ideas that emerged from the workshop; quality products, in terms of energy education, that are capable of retaining the teachers' attention, should be offered, the world of energy constituting a real market.

Luc Blanckaert noted that the energy education segment involves players with, sometimes, conflicting interests.

Dominique Marcaillou, inspector of schools for physical and chemical sciences, thanked the various speakers but regretted however that the world of state education was so little represented and had not really been incorporated in the preparation of this conference. It is now time for fundamental change in the educational curricula. The curricula of lower secondary schools in particular are in the process of being brought up to date; from now on a significant part of the curricula of the French secondary school third year (fourteen year olds) will be devoted to energy. It is worth noting, moreover, that among the six multidisciplinary convergence themes are those of energy, the

environment and sustainable development. Dominique Marcaillou strongly urged state education partners to give their opinions and to assist in the reform of the curricula.

Raphaël Claustre replied to Dominique Marcaillou that ARENE tried its best to incorporate the educational world in the conference. He added that due to the European dimension of the event, it was not appropriate to focus the topics tackled on the reform of the French school curricula.

Damien Cocard, of ADEME, asked if there is, at European level, a relevant umbrella organisation for networks in the field of energy education.

Edgard Bossoken replied that the network FEDARENE (fédération des agences européennes de l'énergie; European energy agency federation) could play this role.

Feliz Mil-Homens explained that the organisation that he works for, the Intelligent Energy Executive Agency, is trying to ensure the centralisation of individual experiments carried out in Europe in the field of energy. He also told the participants about a call for proposals, which will end on the 31 October 2006, and appealed to the players wishing to present a project based on a European consortium. Finally, he indicated the existence of Kids Corner, which has the aim of sharing tools and experiences in the field of energy education.

Andréa Hanke explained that she manages SERENAM, a renewable energies consultancy and distribution company. She wanted to know if the representatives of the relevant ministries from the various countries had been invited to the meeting. She also stressed the significance of the involvement of the world of education, although little represented at the conference. She explained that in fact young people are showing great concern over the subject of energy management and need to be given information at school by teachers that are competent and well-informed on the subject.

Hélène Sanchez clarified that the members of higher education of the three Ile-de-France *Académies*, regional education authorities, had been invited to the conference and that a large number of the European speakers are teachers.

A participant explained that he also represented the world of business. He emphasised the fact that unfortunately high demand from the educational world or people working in construction, comes up against a lack of information from decision makers.

Workshop 3: Training and motivation of teachers

Coordinator:

Hans Pedersen, OVE

Reporter:

Claude Bassin-Carlier, ARENE

Speakers:

Annick Delhaye, PACA region

Sylvette Pierron, Académie de Versailles

Ferruccio Jarach, Eliante

Michel Gregoire, Walloon region

Annick Delhaye thanked ARENE for having organised this conference. She is Vice-president for the environment and sustainable development of the Provence-Alpes-Côte d'Azur region. The question of energy is one of the major issues for the PACA region. An aggressive policy is being driven beyond the specific competence of the regional council for upper-level secondary schools, technical and service staff, continuing education, TER (train express régional; local trains), town and country planning and regional nature reserves.

.1 To structure the regional landscape of EEDD (Education à l'Environnement vers un Développement Durable; Environmental education for sustainable development)

The initiated policy aims for synergy between players in the field and financial resources. The *Plateforme Régionale de Concertation* (regional consultation platform) for environmental education for sustainable development is an informal structure. Created in June 2004, it brings together various institutional players, including the region's two education authorities and, of course, the water agency. It aims to connect local, regional, national, European and Mediterranean processes. In December 2006, it will organise the regional conference on environmental education for sustainable development and has signed an agreement with GRAINE PACA, created in 1991.

.2 To establish innovative practices

Four major calls for projects have been launched since 2002, with the aim of developing innovative activities that can be applied throughout the PACA region. Each is financed up to 300,000 euros.

In 2003, a project from the association Ecopolénergie, called *Economies en habitat social collectif* (savings in group social housing), was driven in the Northern districts of Marseilles, in partnership with leasing agencies. Activities were carried out in various languages in this district, which has 26 different nationalities.

In 2005, the Agence Provençale pour l'Economie Alternative et Solidaire (Provençal agency for an alternative and sustainable economy) published an educational guidebook suggesting new sustainable consumption practices.

In 2006, the project *Recherche action éco-citoyenneté* (eco-citizenship action research) brought together researchers in social sciences, particularly social psychology and behavioural theory, with

players in the field. This campaign simultaneously provided the first with privileged access to fields of research and offered the latter solid theoretical partnerships. This project also led to the definition of eco-actions for ports with regard to the behaviour of yachtsmen.

The project *Education à l'environnement urbain et écomobilité scolaire* (Urban environmental education and school eco-transport) is being prepared for 2007. It consists of making the international 'Walk to School' campaign widespread in the PACA region. Changes in behaviour can only come about if the children are directly involved. Environmental, and also health and safety, benefits could result from this. Additionally, children walking to school arrive in better shape. This project also enables neighbourhood social cohesion to be strengthened. In 2006, 71 communes and 200 school groups were involved.

.3 To assist local initiatives

The PACA region helped with the publication of the educational leaflet *Les énergies renouvelables au bout des doigts* (Renewable energies at your fingertips), helped set up the European FEEDU project by Planète Sciences Méditerranée and with investment to fit out a reception and learning facility for adults and children.

.4 To favour exemplary actions for upper-level secondary schools

Twenty-six voluntary upper-level secondary schools participated in the energy saving programme, with the backing of the entire teaching community. Two research consultancy firms provided the computer equipment.

The most cost effective measures are heating programmers, the installation of light timers and the use of energy saving light bulbs. These simple and inexpensive measures reduce electricity bills by about 10 to 15%, an average of 25,000 euros per year. Bio-composters were installed in 9 upper-level secondary schools; they will be extended to 173 upper-level secondary schools in the region. Organic meals were served in some upper-level secondary schools supported by a pedagogical approach. Finally, the Comité de Liaison Energies Renouvelables (Renewable energies liaison committee) set up Agenda 21 measures.

The entire policy of the PACA region is directed towards breaking away from energy expensive practices.

Hans PEDERSEN asked whether, having received a lot of cooperation, there has been much cooperation with the politicians also.

Annick Delhaye replied that the regional council's resolutions on this subject are, in general, adopted unanimously.

A participant emphasised that switching electronic equipment to standby is preferable, for a short period, to switching them off.

Annick Delhaye agreed but stressed that it is advisable however to switch them off at the end of the day. This practice allows a saving of 700,000 kWh in an average upper-level secondary school, which corresponds with the supply of 33 homes.

A participant asked how to overcome their school's opposition to the implementation of Agenda 21 and a bio-composter.

Annick Delhaye pointed out that the PACA region proposes that school heads commit themselves voluntarily, by supplying them with the tools and financial means. The actions are in general difficult to implement but their operation generally does not pose any problem.

Sylvette Pierron tackled the subject of training and motivating teachers in the Académie de Versailles, an education authority, which represents 10% of the French school population.

The issue of energy is a component of sustainable development education. The start of the 2004 school year was a turning point. Previously, no framework had been defined, despite the implementation of continuing education measures over a period of some twenty years. The decree of 8 July 2004 fixed a framework for the more widespread application of sustainable development education, wide enough for it to be usefully adapted in the education authorities. It promotes sustainable development education being firmly anchored in the disciplines and a project approach, which the teachers and pupils can drive together.

The initial training of teachers is the responsibility of the IUFMs (Institut universitaire de formation des maîtres; teacher training colleges); raising awareness of these subjects however is not systematic and depends on the level of involvement of each institute. The Académie de Versailles for example only offers 18 to 36 hours of training on sustainable development in the first year. In the second year, the offer is no greater. Continuing education must be more than a simple stopgap measure. One to three day modules were offered to teachers, but in 2006 only five in the Académie de Versailles were devoted to environmental topics; the Académie de Créteil, for its part, only offered one.

This lack of continuing education is connected with the reduction of resources available to the regional education authorities. Moreover, the teachers are subject to constraints that prevent them from taking part in training modules.

Since 2004, every regional education authority has established a steering committee responsible for establishing and providing training activities, in order to contribute toward the spread of an environmental culture. Certain training courses were appropriate to regional realities, particularly through the participation of different partners. Joint training between teachers and facilitators enabled them to learn to speak the same language and to achieve concrete results.

The modules offered in 2005-2006 concerned the subjects of climate change, extreme environments, risks linked with climate change and the progress of scientific research.

Beyond these training courses, Agenda 21 type projects allow all members of the educational community to be brought together in global and perennial school projects. The aim of the Académie de Versailles is to encourage these partnerships between different players to contribute toward the development of a common environmental culture among the pupils, giving meaning to the training.

Marine Tran, an engineering student, emphasised that implementing projects comes up against the problem of the weight of the curricula.

Sylvette Pierron replied that teachers of different disciplines must be able to work together. The scientific and technical workshops used to go beyond the standard curriculum; the TPEs (travaux

personnels encadrés; research projects) now provide this framework. The time allocated to multi-disciplinary projects has however been reduced in the last few years.

Rafael Claustre, from CLER, inquired about the level of demand for sustainable development training. He wondered about the need to work on motivating teachers.

Sylvette Pierron acknowledged the need to try to increase teachers' motivation, but stressed that they are becoming more concerned by these subjects both in their personal and professional lives. Many teachers cannot attend training modules due to institutional barriers, and in particular the need to make up lessons.

Marion Guitton pointed out that she has not succeeded in setting up a project due to opposition from her administration and asked whether it is possible to impose them through the education authority or the region.

Sylvette Pierron replied that this type of decision is the responsibility of the school head. The regional education authority however tries to influence the school heads during their training, on Agenda 21 for example.

A participant pointed out that the reticence of school heads can be circumvented by putting forward the argument that environmental education helps reduce incivilities.

In conclusion, Sylvette Pierron stressed that the discussion has emphasised the difficulties of managing energy and environmental education but that a large number of campaigns have been successfully driven.

Ferruccio Jarach (*Liceo Scientifico Tecnico Ambientale* Laveno Mombello) presented an apple that has absorbed energy from the sun, which it will transmit to the apple embryo contained in its seeds and asked whether it is necessary to teach teachers using thousands of books or to explain how an apple tree grows. He drew the attention of those present to a masterpiece of environmental literature, *L'homme qui plantait des arbres*, 'The man who planted trees', by Jean Giono.

Knowledge is not a cloud floating in the sky. It comes from the mind and the heart; the key words are well-being, cooperation and collaboration. The breaking up of hierarchies and the idea of joint change are essential starting points.

The initial idea of the work carried out is that of Liv Randi Lindseth; the action implemented has enabled a 55% reduction in electrical energy consumption, through more sensible use of the resource. This approach is not a path of sacrifice. Switching off lights makes us interact with the sun, the sunflower and apples. This campaign has been picked up in the Italian newspapers and on the Internet.

The teacher training elements have been the following:

- Purchase of two recliners for the teacher staff room;
- Set up of an infusion room and training in sharing supplies;
- Set up of a laboratory with the students to teach them how to build a small solar panel.

Following this project, some teachers asked to install solar panels at their homes. With this aim, a course was therefore organised for the teachers and parents and given by Ferruccio Jarach and his pupils.

A participant asked whether the implementation of the project had given rise to problems.

Ferruccio Jarach emphasised that learners accept a message if the actions of the speaker match their words. For example, it is impossible to use your car to come and teach sustainable development at school.

The students all use motorbikes, due to the 30-year gap in environmental education. The results are very poor in relation to the sums invested in this field.

It is more useful to implement an action of limited scope in order to gradually give teachers the idea of tackling this subject. If there is consistency between the lifestyle and the message, then this can become effective.

The objective is to make this consistency, which at the outset only concerns 5% of the teachers, widespread. The results can then emerge in the long term, as the request for solar panels seems to confirm.

Michel Gregoire, Walloon Région pointed out that the Walloon region is a member of FEDARENE. He added that he manages an administration that promotes the management of energy consumption.

The effectiveness of the message to a young public and teachers requires aids, support that interests the teachers, as well as well-targeted 'flash' animations, which try to attract the public.

An exploratory study by the APERE, association for the promotion of renewable energies, showed that this type of training course is not self-evident and that it is necessary to bring them up to date through continuing education. The mobile teacher, who catalyses the ideas that the region wants to develop has also been implemented and works particularly well in the context of school camps.

The tools offered can be used in the classroom at the front of the Hemicycle building. The *Boîte énergie* (energy box) for example was produced in partnership with the WWF and offered to 200 schools in 6 months. Based on playing cards, the game consists in reducing energy consumption as quickly as possible. It is presented by a member of the WWF and a CD guiding the progress of the game step by step is also provided. The Walloon region has also distributed a DVD on the polar regions and climate change, produced by the International Polar Foundation of the explorer Alain Hubert.

Social energy guidance is provided as required by the public service, which this still stands despite the deregulation of the energy sector. The idea is to make it compulsory for providers to invest in training activities, particularly at the end of primary school and the beginning of lower secondary school. The *rallye énergétique* (energy rally) for example, allows pupils to meet the various players in the sector within the district.

More specific training courses are organised for people working in the sector. Architects and operators in the building sector have been the first concerned. Brochures were created particularly with the Architecture and Climate team of the University of Louvain. Other training courses were run for energy managers and energy advisers.

Three original tools have been created:

- The Héliomobile, supported by a teaching team;
- The Académie de vent (Wind academy), a mobile project financed by the parents of the children taking part;
- The Biobreak, altered by the pupils of a technical school then used in secondary education.

Numerous tools have interested teachers, some circulations, such as *L'énergie expliquée aux enfants*, energy explained to children, rapidly went out of stock.

The European FEEDU project, which followed on from the KIDS4ENERGY project in nine countries and thirteen regional centres, aims to:

- Raise children's awareness to energy issues;
- Offer teacher training courses;
- Make appropriate teaching aids available to teachers;
- Exchange experiences relating to project-based teaching;
- Incorporate this energy education approach in the school curricula.

Three modules are currently planned: a multidisciplinary approach; assessment methodology and assessment; and the communication of results.

The last programme, for which the start-up meeting will be held 15 days after this meeting, is called *Programme d'action et d'éducation à la maîtrise durable de l'énergie* (programme of action and education for the sustainable management of energy). Implemented with two universities it has two parts, technical and educational. Some schools will play an experimental role in order to identify the decision levers and to adapt the education system. The governing idea is that of joint action between pupils and teachers, which should not be driven within buildings whose energy use is badly designed. This project will lead to the writing of a code, which can be made widespread.

A participant from the PACA region energy department asked for details on the assessment methodology.

Michel Gregoire pointed out that this methodology was established within the framework of the KIDS4ENERGY project and that it is based on a questionnaire-based approach for the students and for the other participants. He indicated that he has the text of this questionnaire in English.

A participant added that he has about thirty copies of the text in French.

The session ended at 3.40 p.m.

Workshop no. 4: Integration of energy issues in educational curricula

Moderator :

Denis Masliah, Pédagogie Systèmes

Rapporteur :

Feliz Mi-Homens

Yvette Antomarchi, Lycée de l'Estaque, upper-level secondary school

Eddy Deruwe, ABEA, Brussels Energy Centre

Emmanuel Jeanjean, Rhônalénergie

Irmeli Mikkonen, MOTIVA

Feliz Mil-Homens, IEEA

By way of introduction, **Denis Masliah** emphasised the difficulty of integrating the subject of energy in educational curricula. In fact, it is first and foremost a matter of adult issues. For Denis Masliah however, young people must be made aware of their responsibilities in the face of the public threat that hangs over their future.

He added that the subject of energy is cross-disciplinary and touches on complex and diverse fields such as electricity, heating, transport, waste and buildings, which bring their own issues.

During the workshop, it will be a matter of thinking about the way of inciting young people to want to become involved in the issue of energy, without however creating a generation conflict.

Yvette Antomarchi represents the vocational upper-level secondary school of Marseilles, which worked on the Comenius project on the subject of renewable energies from 2002 to 2005. This technical and vocational secondary school, located in a disadvantaged area, practises work experience and concentrates on cultural and scientific projects.

The Store project, the twelfth European project in which the school participated, focused on the technical applications around renewable energies and involved six schools in Europe. The subject of renewable energies was chosen for its topicality, in particular, as it responded to a concern about citizenship education and cultural and scientific openness and could be harmoniously incorporated in the school curricula. Pupils followed training courses that made them receptive to the subject of energy, a topic that has been studied in a multidisciplinary way at European level.

On the one hand, documentary files were created, which has supplied the joint website of the six schools. More practical and technical projects were also carried out: a mini wind turbine with wind force simulation was installed; various objects such as aeroplanes fuelled by solar energy or a solar water heater were made. Finally, in the third year, photovoltaic panels were installed on the roof of the school. Very detailed specifications were written beforehand by the pupils and complex calculations made.

The project was primarily aimed at teaching the students to carry out documentary research and to use the Internet, to target knowledge learning; to put theoretical knowledge into practice; and finally, to raise young people's awareness of renewable energies.

In more practical terms, the activities carried out included field trips, for example, to the IUT (Institut universitaire de technologie; technical university) and to a wind farm. Group work was encouraged within and between the classes. The 140 students and 30 teachers of the six European schools exchanged experiences. The project was extended thanks to the review that was given at the end of each year. The cooperation entered into between a school in Frankfurt and the vocational upper-level secondary school of Marseilles proved to be very fruitful.

Yvette Antomarchi clarified that the teaching team came up against some difficulties, the projects being extensive to launch and requiring significant resources. It also proved to be difficult to get the young people to communicate with each other. Time outside of school also had to be found. According to Yvette Antomarchi, while it was undeniable that the young people's awareness had been raised to renewable energies, it seems unlikely however that conclusions will be drawn with regard to a possible change of lifestyle on their part. Finally she emphasised that the main attraction of this programme resides in the different methodology that it puts forward in relation to traditional teaching.

Denis Masliah asked if it is also appropriate to tackle, in class, the energy issue from the angle of the problems that France is encountering, which could be more effective in raising the pupil's awareness.

Yvette Antomarchi clarified that the energy issue is tackled in history-geography, in particular, which enables the economic problems that it causes in France to be touched on.

A participant asked what form the inter-European exchanges had taken during the project.

Yvette Antomarchi explained that the schools involved exchanged what they had produced via the Internet. Groups also met which enabled the concrete achievements of each to be studied. Finally, twice yearly, the teachers met within the framework of Comenius to share their teaching practices.

Emmanuel Jeanjean presented the activity of Rhônealpennergie through the work carried out during two European projects. He explained that the Agence régionale de l'énergie et de l'environnement (Regional energy and environment agency) works in close contact with the Rhône-Alpes region on promoting the use of renewable energies and implementing Agenda 21 in local authorities. The agency is also entrusted with a resource centre mission, develops programmes and actions at regional level and regularly works at European level.

The Grasping Climate project, driven in partnership with the Swedish and the British, aimed at indexing existing teaching aids and at initiating role-plays in schools. An exhibition was set up and a teacher's guide published.

The FEEDU project (2005-2007) involves sharing assessment and teaching tools, training teachers and monitoring schools. It has enabled, in particular, the distribution of the *climattitude* guide.

Rhônealpennergie was able to draw a few lessons from these two experiences. Firstly, it should be noted that, with teachers being very much in demand, the tools must remain simple to be appropriate. They must also be adaptable and able to be modified according to the class, and finally they must be in touch with the school curriculum.

With regard to the design of the tools, it seems essential to work with the teachers to ensure that they will be really useful to them. It also seems fundamental to include energy education lessons and training courses in regional education authority training programmes, which will enable

teachers to work on this subject in an official capacity. They will also be more easily mobilised. In consultation with the school inspectorate of middle schools (ages 8-11), Rhônealénergie concluded the basic notions relating to energy (consumption, power, etc.) should be tackled first before touching on the issues of energy management or France's energy balance with the pupils.

Rhônealénergie also created exhibitions, a veritable teaching aid, the department-wide distribution of which is provided by the Rhône departmental council.

Emmanuel Jeanjean also emphasised the fact that the demand for tools is still very high and that local authorities are often interested in the supply.

Rhônealénergie also noted that setting up a teachers' network was still difficult.

Rhônealénergie drew the attention of those present to the fact that the subject of energy must be tackled in a multi-disciplinary fashion. It is, moreover, the opportunity to work on concrete aspects. Many partners such as local authorities or energy providers can be called on. Cooperation with state education representatives appears crucial, particularly in determining the way of dealing with the issue and of designing the appropriate tools.

It is worth noting that while the subject of energy can be broached in a standard way through the school curricula, school projects offer the opportunity to delve deeper into the subject.

By way of conclusion, Emmanuel Jeanjean emphasised the opportunity to study the issues relating to school buildings. In many cases, it is easy to achieve 10% energy savings, funds that could then be invested in teaching programmes. This seems to me to be an argument to mobilise teachers.

Denis Masliah noted that the cooperation between local energy players and state education seems problematic. He asked Emmanuel Jeanjean what criteria Rhônealénergie uses to select its tools. He also wondered about the expectations of the teachers.

Emmanuel Jeanjean explained that Rhônealénergie makes a large selection of tools available to teachers and expects feedback from them, which subsequently enables a more discriminating selection. It might be that the lack of financial means sometimes guides the choices but the manner in which the tools were designed and their ease of use are also selection criteria for the teachers.

Dominique Marcaillou reminded those present that it is the third year of the national environment programme for sustainable development. State education is therefore very interested in contributions but would like its partners to work with it more upstream, in such a way that the tools offered are harmoniously incorporated in the framework of the school curricula. In fact, too often, the teaching packages received cannot be validated due to lack of consistency or scientific stringency. With regard to this, Dominique Marcaillou drew the attention of the participants to the confusion that prevails all too often in terms of vocabulary; the notions and units should be defined first and foremost. He reiterated that energy is not consumed but is converted into degraded forms.

Emmanuel Jeanjean explained that Rhônealénergie was attempting to initiate an upstream project with the school inspectors responsible for environmental education but it must be noted that they are often unavailable. He added that the state education system and the associations that launch projects are not going by the same time scale. Projects need to be launched quickly so as to obtain the necessary financing whereas the state education validation process is slower.

Denis Masliah considered that limiting the subject of energy to the purely scientific field is an error. Energy is a multidisciplinary issue, which should be studied in its political, historical and sociological dimensions.

Dominique Marcaillou did not disagree with this. He added that energy is for that matter one of the six convergence themes. He nevertheless repeated that the vocabulary used must be agreed first and foremost.

Andrea Hanke, an engineer, also emphasised the need for vocabulary to be clarified while emphasising the global nature of the issue.

Johann Vacandare also emphasised the consumerist dimension that the subject of energy carries. Likewise, at state education level, he thought that energy should be placed in the current geopolitical context in such a way that young people grasp the topical issues.

A participant asked if state education had nominated referents responsible for incorporating the issue of energy in the school curricula.

Dominique Marcaillou replied that he himself belongs to the group of experts that devised the new physical and chemical sciences curricula, which incorporate the issue of energy.

Philippe Roy, RENARD, said that he totally agrees with the remarks regarding the need to give physical and objective definitions. In fact he lamented the lack of stringency the moment it becomes a question of touching on issues relating to energy with pupils. He added that economic players should be mobilised, as they should also implement actions aiming to manage energy consumption. Unfortunately individual actions alone will not be enough.

Eddy Deruwe presented the FEEDU project, which is aimed at children, aged 10 to 12 years old, and is being implemented by thirteen energy agencies in nine European countries. It focuses on the subjects of renewable energies, the rational use of energy and transport.

Environment related issues are generally in the school curriculum but are often not an educational priority for the teachers.

FEEDU intends to develop a strategy aimed at teachers and the educational authority. Several major challenges have been identified. Firstly, each project on the subject of energy should be developed according to a timescale spread over the year. A project approach enables stronger commitment and more investment. Moreover, the project should be driven according to well-defined stages: the introduction of the project, the carrying out of exercises, and finally the implementation of practical achievements to be assessed at the end of the year. Energy education must be linked to the educational curriculum.

With regard to the aids to be used, it is worth noting that schools generally have little investment means. Of the hundred or so tools identified in the world, only about forty have been retained. They can be used during the exploratory stage in particular. Generally, teachers welcome the tools that are offered to them, their rejection is an inevitable sign of mediocre educational value. It seems very important that the children formalise their knowledge by creating posters, exhibitions and carrying out press conferences. Communication between children, parents and the school is an important parameter in the success of a project.

The FEEDU team would like to introduce in energy education the notions of consumption management and control. Energy savings at school can also be measured which will give the children a more practical picture of the subject.

To conclude, it is, above all, the strategy used with environmental education in mind that seems important. In April 2007 a colloquium on the subject will be held in Ljubljana.

Denis Masliah asked which tools used are able to engage the children. He wondered about the criteria used by FEEDU to select the schools that will be able to benefit from the implementation of the project.

Eddy Deruwe explained that the aim of the project was to propose a methodology that enables every teacher to work independently, without necessarily having any external help. In reality, the time spent in schools should be minimised. The teaching aids that the teacher might need are supplied by the energy agencies.

Denis Masliah asked if the teachers are available and interested in the project.

Eddy Deruwe admitted that at the start, many teachers seemed reticent or to not have the time to commit. The introduction of the project in the institutional framework, via training courses, however rallied a larger number of teachers. They also state that the duration of the training course timetable, 18 hours, is still not enough.

Dominique Marcaillou reminded the partners present in the room that the state education training departments, DAFOR and DAFPEN, are at their service. He clarified that the 2007-2008 training programmes are currently in the process of being established. He therefore encouraged the participants to benefit from the opportunity of introducing themselves to the state education bodies and of becoming official institutional partners.

A PARTICIPANT asked if the project was primarily about including education in the curriculum or trying to reduce energy use in the school?

Eddy DERUWE responded by saying that work is mainly about energy education in schools. The secondary aim is regarding energy consumption in the school. The curriculum issue is also secondary. However, it is in it, but it is not the main focus.

The same PARTICIPAT stated that she works for Atkins and that she delivers energy education for Oxfordshire County Council. She spends three days per year in a school to help reduce energy consumption.

Eddy Deruwe clarified that the money saved will be used for carrying out school activities. The calculation of energy savings is carried out by the children.

Ms Catherine Maby from Swerin Energy Agency stated that the theoretical description is not without its practical aspects. She wished to highlight the project base in her local work. They have taken that concept and their projects link in very much to energy use in the school building. There are many different agendas to which they are connected. Their business is very much to work in partnership. Energy comes into every subject and every part of our lives. And that is part of their message. Ms Maby stated that we have to make those connections across very simple educational points.

The age groups her organisation is working with on this particular project is seven to nine year olds. A lot of the curriculum and targets are skills-based rather than knowledge-based and they work with different subject matters to achieve that. Their work is different to the health, environmental, or citizenship agendas. It therefore really fits in with some of the more theoretical educational descriptions that have been given – and not in contradiction to them.

Irmeli MIKKONNEN from MOTIVA in Finland then made a presentation. In Finland, they have free schooling, with most of the schools being public, Finnish-speaking schools. A little over 10% of the Finnish population of 5.2 million people are in primary education. Children start school at the age of seven, with pre-school before that, which is voluntary.

That national core curriculum is renewed every 10 years. This was last done in 2003 for secondary schools and in 2004 for primary schools. In this new curriculum, they have cross-curriculum keys and much to the satisfaction of MOTIVA, energy topics are included. The curriculum states that in certain types of school, certain subjects much be taught, but there are no particular rules on how to do this. This gives flexibility for activities and hands-on experience and so on. Teaching about energy begins very early, in first form, and begins by explaining what energy means in our life.

Physics and chemistry education begins in fifth form, and this can be a challenge as they do not necessarily have a specific, expert teacher on these subjects. Materials, instructions and training experiences are very valuable to the teachers since their personal interests or expertise may not lie in energy.

.1 Extra-Curricular Information

The textbooks available are not always ideal. However, students also receive the information through different channels these days, and with the environmental awareness of modern-day students, they often do not need to be educated in schools on this topic. That is a very important change.

In terms of cooperation with business, expert visitors will come to schools, as well as site visits by the students to witness the different energy production methods.

.2 Work Experience

There are also key work experiences where the students go to work in a business or industrial site for one week which can be quite demanding, but this gives them a very good view on what is involved in the businesses in which they complete their work experience.

.3 Teacher Training

Ms MIKKONNEN then went on to explain that teacher training is very important. The basic training of teachers is quite good and it is one of the key development areas at the moment. A specific programme which MOTIVA established two years ago operates with several stakeholders who are funding the programme. They have teacher training, workshop seminars and science camps, and they also provide tools and equipment for schools.

Denis Masliah thanked Irmeli Mikkonen for her pragmatic remarks. It seems that Finland has a much more developed cooperation between the worlds of education and business; certainly one of the explanations for the craze for energy education.

A PARTICIPANT asked Ms MIKKONNEN from what age do the students partake in work experience.

Ms MIKKONNEN explained that it was from about age 13. Later, they can sometimes spend two weeks on work experience.

Plenary session: Report on workshops 3 and 4 and debate

Coordinator:

Luc Blanckaert

Speakers:

Claude Bassin-Carlier, Director of ARENE Ile-de-France

Feliz Mils-Homens, IEEA

Claude Bassin-Carlier emphasised that the summary of different experiences is difficult. About fifty people attended workshop 3, based on a selection in keeping with the parity and diversity of age groups. The debates demonstrated interest and optimism rather than criticism, complaints, alarm or blame.

Four speakers took the floor: Annick Delhaye presented the policy of the PACA region; Sylvette Pierron, that of the Académie de Versailles; Ferruccio Jarach led the debates that were both technical and administrative and educational and poetic; and finally, Michel Grégoire presented effective proposals for action implemented in the Walloon region.

The issue of motivating and involving people did not come through. The inclusion of all the players in the training of the educational team was mentioned as a condition of the effectiveness of energy education actions. The issue was also raised about the transition from the involvement of a few teachers to a much more widespread movement. Ferruccio Jarach demonstrated that, for example, pupils' requests can lead to motivating teachers. In PACA, at least 26 upper-level secondary schools out of 173 are voluntary. In the Walloon region, companies entering the electricity market are committed to the training of pupils and teachers, as required by the public service. Among the arguments voiced in favour of environmental education was the idea that better knowledge of the environment enables a reduction in incivilities.

This abundance of proposals leads to the possibility of defining more precise developments in a subsequent meeting.

Feliz Mil-Homens reported on the work carried out in workshop 4, dealing with the incorporation of energy issues in school curricula. Four presentations dealt with the subject from different perspectives. The presentation of a practical programme implemented in a vocational school was followed by a more top-down approach, then a presentation of the FEEDU project and methodology issues. The final presentation concerned Finland, its education system and the incorporation of energy, particularly in primary school.

The project driven in the vocational school involved pupils between the ages of 16 and 22 in Marseilles, and also in six different countries, according to a multidisciplinary and hands-on approach with the construction of a wind turbine and cars running on solar energy. Its objectives included education in citizenship and cultural and technological education. The project was successful in raising the pupils' awareness to the importance of energy.

The Rhôneénergie association for its part supplies teachers with tools, after having selected them according to criteria, cost, availability and ease of use. The need for a partnership between the players was asserted particularly for the issues of language and concepts.

According to the FEEDU project, the incorporation of energy issues in the school curricula must be subjected to a clear methodology. The tool is *project-based learning*. This is driven with schools, with an introductory stage, then the development of practical work and finally *feed back* to the parents or friends. The players of the project intend to demystify teaching tools, which do not necessarily have to consist of high technology.

Finally, the Finish school curriculum has just been reviewed. Finland is a successful case study regarding the incorporation of energy in education. Schools have great autonomy in defining their curricula; national rules are very general. Moreover, much attention is given to teacher training.

.I Debates: a few remarks from the room

Jean-Pierre Desbrosses, from the school in Rambouillet, pointed out that in agricultural training it is, above all, a matter of implementing multidisciplinary project methodologies. Curriculum definitions must not be too strict.

A participant from the Service écologie urbaine (Urban ecology department), asked what technological and pedagogical support he can use to help teachers set up projects.

Hélène Sanchez, from ARENE, pointed out that, in partnership with DRDJS, eight workshops dealing with the suitability of the game *Citénergie* will be offered to the coordinators in the eight Ile-de-France departments.

Denis Masliah lamented the lack of time that teachers have to train in energy and waste management.

Sylvette Pierron highlighted the need for pluridisciplinarity. Training must be reviewed to open up teacher training to teachers and conversely, in order to find solutions to the language issues and the identification of the messages. The global and systemic approach to an issue enriches the thought process.

Luc Blanckaert welcomed the return of particularly full workshops. He stressed that specific meetings further everyone's thoughts and actions.

Round Table: Concrete actions for the future regarding energy education

Coordinator:

Luc Blanckaert

Speakers:

Anita Eide, European Commission

Liv Randi Lindseth, Norwegian energy agency

Michel Vampouille, Vice-president of the Ile-de-France regional council

Anita EIDE from DG TREN in the European Commission, explained that the European Union (EU) is committed to the Kyoto protocol to reduce greenhouse gas emissions by 8% by 2012

compared with the 1990 level. The range of new directives addressing energy issues are not going to resolve them. There is also a Green Paper on energy efficiency, 'Doing More with Less', as well as a forthcoming action plan on energy efficiency that will outline a number of actions that will be implemented by the Commission and member states. The Education Commissioner is very committed to education in general. Improved energy efficiency is one of his priorities, but Europe can only achieve this goal when it becomes everyone's priority.

Ms EIDE said that security of supply is a current issue, with 50% of the EU's energy being imported from outside Europe. By 2030, this is expected to be 70%. Given the political situation, this is worrying. The energy demand situation is very unlikely to improve, with high energy prices. Energy used generates about 28% of greenhouse gas emissions and future generations will have to live with the consequences of what we are doing today.

Moving Towards Sustainable Energy

Ms EIDE stated that the choice is to either reduce demand on energy or increase the share of new and renewable energy sources into the energy system. Demand is as important as supply and one of the EU's priorities now is energy efficiency. Sustainable energy policies encompass both supply and demand. Demand-side actions could save about 20% of the EU's energy by 2020. We need to create infrastructures to improve efficiency in transportation systems and distribution grids and so on. Behaviour change is essential. This is not just personal or householder behaviour, but behaviour across the board. Changing behaviour has proved to have a long-lasting impact and it is important to start with the very young. Responsible energy behaviour cannot be imposed through centralised policies; it has to be about raising awareness and resulting changed behaviour.

Results will come from individual decisions too and this can lead to money being saved. Efficiency behaviours influence each other and higher efficiency can lead to cheaper prices.

Education

When discussing education, Ms EIDE said that education is an essential tool to induce behaviour change. When targeting children, you do not just affect their behaviour at school; it will be something that stays with them for life. It also has an affect on their family and friends. As most projects take place in schools, practices that are carried out in a project might influence the way schools deal with their energy management. This might in turn spread to school authorities and the general energy management of buildings.

Education is based on a very integrated approach involving local authorities, schools, teachers, parents, energy agencies, energy specialists and behaviour psychologists. This approach requires cooperation and it is difficult to get all the right players together at the same time.

Education plays a very strategic role in approving energy efficiency and environmental energy production. Member states have exclusive competence in education and they decide what goes into the curriculum. However, the Commission has a role in developing activities in this area in disseminating information and promoting best practice.

EU Action

Ms EIDE then went on to say that the EU supports specific education projects for action, providing co-financing of 50%. The EU's Intelligent Energy Europe programme supports the establishment of thematic workshops. The current programme covers the period from 2003 to 2006, while the competitiveness and innovation programme, which has not yet been formally approved, will run from 2007 to 2013. Intelligent Energy Europe will be one of three programmes under that

umbrella. We are currently working on developing the work programme, which will definitely include education.

What Others Can Do

The quality of the managed energy website depends on people's input. While there is a lot of material already on the website, new material, particularly in French, would be welcome. Ms EIDE explained that people can discuss ideas with DG TREN and these may find their way into the work programme and receive finance from them. People can share their ideas and participate in the development and implementation of the Intelligent Energy Europe programme. As well as DG TREN, people can also contact their national contact point.

Managed Energy Kids Corner

Managed Energy Kids Corner is a project that addresses the three target groups of children between the ages of seven and 11, children between 11 and 15, and teachers. There are games for everyone and a teacher database on energy education resources, which is quite easy to use. There are also web pages for children and for older students and various thematic pages on renewable energy savings, sustainable transport, climate change and citizenship, in 21 languages. DG TREN have tried to put on as much material as possible and do not now have a lot of money left to add to the website. They therefore rely on others to provide more material. They also rely on people in the different countries to provide them with information on relevant links. The website also has forms for feedback.

The website had about 9,000 hits in May/June 2006, and it shows that there is a link between the use of Managed Energy Kids Corner and activities being carried out in school.

The Way Forward on Energy Education: The National Rainmakers Concept (Liv Randi LINDSETH)

.1 The Need to Engage Children

Ms Liv Randi LINDSETH from The National Norwegian Energy Agency made the point that children are the decision-makers of tomorrow and she believes that they will have an impact on what happens in the future. However, they also have an impact today as regards how energy is used in their schools and in their homes.

To be able to reach children, you have to know what you are competing against. Today's children are saturated in entertainment and have become media-savvy consumers. They know what they want and are all familiar with the Internet. To compete with all of that, something must be developed that is of the same quality. We also have to deal with them in the arenas where they are already active. As well as at school, children should also be targeted at home. We need to try to reach them through TV, as well as the Internet. Children need to be engaged in activities that they enjoy and will naturally participate in.

Ms LINDSETH said that we will fool ourselves if we think that children are really interested in energy sustainability. However, if we present the subject in a way that is fun and engaging, we may be able to trigger their interest. This is the starting point for our concept.

'Behaviour and doer' is very important. This theory states that if you make people do something, it will have an impact on their attitudes and release new behaviours. Children may therefore see themselves as environmentally conscious, and the attitudes that they are forming will make them

more likely to behave in a similar way in the future. It is therefore very important for children to become interested and to participate. This is 'Learning by Doing' or 'Learning by Having Fun'. People are more likely to change behaviours if they like the learning process, and humour is an important tool here.

.2 The Rainmakers Concept

Ms LINDSETH then explained The Rainmakers Concept. This uses all the arenas where the children are present. The tools used are games, books and events and so on. Everything is activity driven and fun. Branding the energy message is also very important. Whether the message is conveyed at home, on the Internet, on TV or via teaching materials, it is the same thing. This is about creating the notion that the Rainmakers are everywhere. This is a bottom-up approach, with the children wanting to be involved.

Ms LINDSETH's organisation uses a special Rainmakers story written by a famous Norwegian author. It has energy as its subject and sustainability is a very important part of that. There is also a song and a dance. Making the children interested in the local environment is also part of the concept.

The use of TV is also very important and they have an energy topic on a Saturday morning TV show. There has also been a drama series and live games on TV, where children get engaged directly. Children can also be a real TV reporter where they report on good energy performance in their communities. They use the national Norwegian broadcaster who has 100% coverage, so they have a great opportunity to get their message across. Linking TV and the Internet is also a very important part of this.

The website is also crucial and supports all their policy instruments. It contains a fully integrated package of features

59% of Norwegian children between the ages of nine and 12 are aware of the Rainmakers Concept and, overall, there is an awareness level of 46% of the concept. There is an increased knowledge of energy and renewables in the target group, with significant differences evident amongst those who know the Rainmakers Concept and those who do not.

Luc Blanckaert pointed out that it is still not possible for the ideas of the Norwegian consortium to be adopted in the Ile-de-France, which does not have a unique audiovisual network.

Michel Vampouille stressed the importance of the exemplarity of school buildings and behaviour. In schools, as in all public buildings, displaying an energy consumption balance would be useful.

France shows a certain delay as regards energy consumption, the electricity company EDF never having shown much interest in renewable energies, which only specialists are currently acquainted with. The Ile-de-France region wants to make all water heaters operate on solar energy. Thought is also being given to school facilities, which are only used during the school term and are therefore more often closed than open.

The efficiency of new installations has an educational role, but Michel Vampouille stressed that some installations with low profitability, such as solar water heaters, also have an interesting educational aspect.

Céline Augier, manager of the Ateliers nature (Nature workshops), in Montreuil, stressed the need to make government experts partners in training courses.

Alain Corea, member of the collective Sortir du nucléaire 76 (nuclear phase-out 76), emphasised that the construction of the new European Pressurised Reactor is using funds that could have been allocated to renewable energies.

Denis Masliah considered that the centralisation of energy production is the main curb in the development of renewable energies.

Raphael Claustre asked how the idea of the television show could be reproduced in France.

A PARTICIPANT said that The Rainmakers project is very impressive, although it might be difficult to replicate in other countries and to make teachers funny.

Ms LINDSETH said of course it can be done in France. She said that it all started as an idea that came from a British Broadcasting Corporation (BBC) programme called 'Alive and Kicking'. They then worked to have an energy subject included in the Saturday morning TV programme. There is also energy in a reality TV show and this has been also done in Sweden, Finland, the Netherlands and Denmark. We cannot make teachers funny but we can give them things to work with.

Ms EIDE then explained that they have a project called 'Kids for the Future'. The idea is to take elements of the Rainmakers Concept and work with partners in 10 different countries. She believes, therefore, that it is very possible to replicate things. You just have to take each country's cultural context into account.

Sylvette Pierron was surprised that the message of raising awareness of the environment be subjected to a marketing approach. In her opinion, education must concern reasoning, thought and an awareness of future populations.

Ms LINDSETH then said that it is very important not to lose sight of the message. Quality assurance and technical competence are also very important. However, she does understand some of the concerns that have been expressed.

Sylvette Pierron found it shocking that the environment could be considered a product, sold like chewing gum.

Ms LINDSETH stated that they cooperate with the Director for Primary and Secondary Education and energy is also part of our curriculum.

A participant emphasised that education must be defined from the needs of the children. In his opinion, it is more effective to act with the heart, rather than to drive marketing approaches.

A participant replied that education consists in starting with the language of the child to bring it to a higher level. He pointed out that in 1993 he suggested that his pupils write rap music about the environment. The teacher's duty is to anticipate the needs of society.

Céline Augier pointed out the large number of interesting projects and lamented their low media profile in France, contrary to that in the Netherlands for example.

Mr DE LA SALLE made the point that there are different experts with different views here, but that he believes that results are more important than the approaches.

Luc Blanckaert hoped that the debates will be able to continue during subsequent meetings.

Marie-Pierre Digard said that the debates were very interesting. She welcomed achieving the feat of confronting the worlds of education and energy. She emphasised the magnitude of the work that remains to be achieved and which has brought together many participants committed to changing behaviour.

She thanked the speakers and participants at the conference, many coming from different regions of Europe.

Awarding the prize for the European drawing and photo competition 'Changing the European Energy Landscape'

Jean-Paul Huchon, President of the Ile-de-France regional council

Jean-Paul Huchon welcomed the participants present at the forum, which included Michel Vampouille and Marie-Pierre Digard, president of ARENE Ile-de-France.

The environment is the Ile-de-France region's fourth budget item, with more than 120 million euros. This region has given itself the paradoxical objective of becoming the leading eco-region in Europe. This is very appealing, as many actions require adherence to environmental criteria; contracts worth 4 to 5 million euros have been signed with various municipalities to respond to this objective. The regional council is considering new actions aiming to improve energy savings. Michel Vampouille's major energy plan consists particularly in systematising the measuring of energy consumption.

The region has 468 upper-level secondary schools, more than Belgium and the Netherlands together. In 1998, none of them were built according to the Haute Qualité Environnementale (HQE) sustainable building standard. Particularly virulent debates were held which put forward, among others, the argument that the Haute Qualité Environnementale was far too costly and that too few companies were capable of applying this standard. Despite opposition, the 195 upper-level secondary schools currently under construction have all been designed according to this standard.

Moreover, it has now been laid down that, as of 2008, and if possible immediately, the HQE standard be applied to the construction of local authority housing, with the penalty of regional financing being stopped. The construction of roads and motorways is also affected by these new rules, which enables the creation of ecological corridors.

Measures to use solar energy in local authority housing have been taken, for example, in Montreuil, 30,000 new dwellings will be linked to a geothermic programme. The region has also financed the putting into service of clean vehicles within the RATP (Régie autonome des transports parisiens; Paris city transport authority).

An assistance programme for private individuals for renewable energies was recently established; 45 files were passed on the 20 September.

The regional government is committed to and motivated by its programme, which requires that awareness raising and communication be stepped up, particularly for the 500,000 upper-level secondary school children. It is also a question of helping all of the municipalities that request it, to implement Agenda 21 measures.

All of these actions, with the impending creation of a regional energy observatory, pertain to a mobilisation to deal with the issue of warming climate. Young people and elected members are special targets and exchanges with various European countries are also encouraged.

The regional council has faith, which animates its environmental programme, and also a sense of reality. Its action, for example, translates as the increase in the public transport budget from 300 million to more than 1 billion euros per year, and the support of AirParif and BruitParif, organisations responsible for monitoring air quality and noise pollution in the Paris region.

Jean-Paul Huchon thanked the participants at the conference and wished them a safe journey. He assured them of the significance of the concern for the environment and energy in Ile-de-France.

Luc Blanckaert pointed out that the prize for the European drawing and photo competition 'Changing the European Energy Landscape' was awarded to Adrian Perez-Velasco, a 13-year-old Spanish boy. Cruz Martin-Granizo from regional energy agency of Castilla y Leon receives the prize in the boy's place.

The session ended at 6.10 p.m.