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Regional Development and Community Support for Radioactive Waste Management

Synthesis of the FSC National Workshop and Community Visit Tengelic and Bátaapáti, Hungary 14-17 November 2006

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FOREWORD

The Forum on Stakeholder Confidence (FSC) is a working group of the OECD Nuclear Energy Agency (NEA). Through its initiatives, the Forum contributes to a new approach to decision making for radioactive waste management. Efforts are focused on developing a dialogue among stakeholders and on seeking to build durable confidence in management solutions. The stakeholders include any person, group or institution that has an interest or a role to play at any stage of the decision-making process.

The FSC organises workshops in a national context to provide a framework for direct exchange among stakeholders in an environment of respect and mutual learning. The FSC workshops provide host country stakeholders with an opportunity to present and to analyse their own experience in a neutral context, to benefit from the experience of the international participants and to leave a record of their points of view. International delegates gain a better understanding of the history and practice of radioactive waste management in the host country. All participants improve their knowledge of the factors influencing public confidence in the field of radioactive waste management; bases for additional dialogue and co-operation amongst stakeholders are also created.

The 6th Forum on Stakeholder Confidence (FSC) National Workshop and Community Visit was held on 14-17 November 2006 in Tengelic, Hungary. The FSC workshop focused on those factors that contribute either to the success or failure of a repository siting process. Experience gained in Hungary over the past two decades provided the context for the discussions. In particular, the workshop highlighted the role and modes of operation of local public oversight and information associations, which proved to be instrumental in reaching an agreement between the implementer and the local communities.

Hosted by the Hungarian national waste management agency PURAM, the workshop was attended by institutional authorities, local residents and stakeholders, 11 mayors and more than 30 FSC delegates from 12 countries who learned and exchanged views about Hungary's management initiatives. Overall, some 40 volunteer local residents responded to PURAM's invitation to attend the workshop, taking time away from their working lives to engage with interest in the discussions with the FSC delegates. The workshop included a visit to the community of Bátaapáti, where PURAM was developing, and is now operating, an underground repository for short-lived, low- and intermediate-level radioactive waste (LILW).

These proceedings include a summary of the workshop presentations and discussions.

Acknowledgements

The FSC thanks all the villages and the many Hungarian stakeholders that contributed significantly to the success of the workshop. Claire Mays acted as editor of these proceedings and summarised the workshop presentations and ensuing discussions. Roundtable discussions were reported primarily by the FSC members chairing the respective sessions. The thematic reports of Sessions 5 and 6 were provided by Thomas Webler, Andrew Blowers and Erik Van Hove. Claudio Pescatore, Yves le Bars, Peter Ormai and Anna Vári served as the workshop's programme committee.

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OVERVIEW OF THE RADIOACTIVE WASTE MANAGEMENT SITUATION IN HUNGARY AT THE TIME OF THE WORKSHOP

In the late 1980s and early 1990s, attempts were made to find a site for a repository to dispose of the LILW generated by the Paks NPP (Hungary's only commercial NPP). The top-down approach taken failed due to vigorous public opposition. In 1993, a new site investigation programme was initiated using a significantly different approach. Site selection criteria included not only technical and geological factors, but also local acceptance to be taken into consideration. A voluntary siting process was launched, in which public information and financial incentives played a crucial role. The LILW siting process resulted in the selection of a site (Bátaapáti) in the granite. In July 2005, a local referendum was held in Bátaapáti which approved the repository, and in November 2005 the national Parliament voted to establish the facility.

In Hungary, another project started in 1993 with the aim of identifying suitable host rock for disposal of spent fuel and/or high level waste (HLW). The exploration tunnel excavated in the Mecsek Uranium Mine reached the claystone formation in 1994, and the on-site underground data acquisition began in this area. Between 1995 and 1998, a short-term project was launched to characterise the rock mass known as the Boda Claystone Formation. In 1999, however, a decision was made on closure of the uranium mine that led to termination of the project. In this situation, PURAM worked out a new strategy and a programme to be accomplished in the coming years and decades. The surface-based exploration programme in the same area (Western Mecsek Mountains) restarted in 2004. PURAM's aim is to designate a location for an underground research laboratory where exploration of the claystone could be accomplished. The HLW repository project is rather complex as no final policy has been approved and different options are kept open.

Radioactive waste management is governed in Hungary by the Act on Atomic Energy. According to this law, in order to regularly provide information to the population of the communities in the vicinity of the facilities, the licensee of an NPP or a radioactive waste management (RWM) facility shall *promote the establishment of a public oversight and information association and can grant assistance to its activities*. Consequently, the law established the legal basis for providing financial incentives to the supportive group of municipalities. Funding provided for the associations can be used for public information and oversight activities, as well as for regional development purposes.

Making use of this possibility – and in some cases even before the law – public oversight and information associations have been established for the near surface LILW repository at Püspökszilágy ("Isotope Information Association", ITT) and the planned new LILW repository under construction in Bátaapáti ("Social Control and Information Association", TETT), as well as for the interim storage for spent fuel at Paks ("Association for Public Information and Oversight", TEIT) and the candidate siting area of a HLW repository at Boda ("West Mecsek Public Information Association", NyMTIT).

The FSC workshop focused on those factors that contribute either to the success or failure of a repository siting process. Experience gained in Hungary over the past two decades provided the context for the discussions. In particular, the workshop highlighted the role and operation of local public oversight and information associations, which proved to be instrumental in reaching an agreement between the implementer and the local communities.

OPENING BY HOSTS

The first half day of the Hungary workshop was devoted to a technical and social overview of the Hungarian waste management context.

The proceedings were opened by FSC member **Peter Ormai**, main organiser of the workshop and Chief Engineer at Hungary's public waste management agency PURAM, who introduced the other hosts. **József Hegyháti**, Managing Director of PURAM, extended his welcome. He mentioned that Hungary has had both failures and successes in radioactive waste management. At one time, public strife made it almost impossible to envision siting a disposal facility. PURAM was founded in 1998 with the intention to maximise chances for success, through complying with a national law which foresees opportunities for financial incentives and integrates public participation. The definition of success must include that the directly affected local population looks upon a facility as safe. PURAM places a strong accent on providing guarantees that it fulfils its responsibility to provide safety. The fact that a majority of citizens in Bátaapáti voted in favour of hosting the future LILW repository is a demonstration of success, and PURAM employees consider that they must maintain and deepen the relationship with local citizenry that underlies their confidence.

Dr. Hegyháti emphasised that Hungary was an open country seeking to increase transparency, and welcomed the international scrutiny by the FSC (a group in which PURAM has participated since the first meeting). He extended thanks in particular to the numerous representatives of the local Information Associations and settlements. These participants are not waste management specialists and were attending the workshop on their own time.

Mayor **István Gáncs** then welcomed delegates in the name of Tengelic's 2500 residents. The township, which served as venue for the workshop, is in close proximity to the Paks Nuclear Power Plant. Local government and residents have daily contact with the NPP. Before the plant was constructed in 1981, Tengelic's economy was based mainly on farming and light industry. Today the town maintains a "symbiotic" relationship with the plant, which provides significant employment and tax revenue. Tengelic residents are keen on preserving their environment and are proud of its nature preserve, home to bird colonies and a variety of wild orchids. Tourism might be a new area of development for Tengelic.

Claudio Pescatore of the OECD Nuclear Energy Agency Secretariat thanked the mayor, PURAM and other institutional partners for their excellent support in organising the workshop. He acknowledged the commitment of the local stakeholders in attendance. FSC workshops, Dr. Pescatore pointed out, are important on several levels. They gather under one roof representatives of the range of institutions and stakeholders involved in a country's radioactive waste management; to our knowledge, this may be accomplished for the first time in Hungary during this event. Workshops provide a historical review of a management process and document it for the future. Finally, "crossing boundaries" between countries and stakeholders creates new and renewed possibilities for co-operation and dialogue. Dr. Pescatore was struck to see so many Hungarian actors willing to be engaged in this opportunity. He said that the FSC takes this as a sign of the maturity of the Hungarian

programme and hoped that all participants would take full advantage of the possibility to learn and grow, as in past FSC workshops.

Finally, **Janet Kotra** spoke as Vice Chair of the FSC. Thanking the organisers and participating municipalities, she also listed the hosts of the six previous workshops held in a national context. Each workshop provides a unique opportunity for international delegates to discuss important and difficult decisions attendant upon their own waste management programme. Dr. Kotra expressed her confidence that participants would learn much about the Hungarian setting and how Hungarian actors will work together to assure a responsible solution for their waste. She was appreciative of their willingness to open the Hungarian process to review and to let all voices be heard.

SETTING OF THE SCENE

Radioactive waste management in Hungary

The first session on the opening day of the event, entitled "History of Radioactive Waste Management in Hungary and the Hungarian Institutional Scene" was chaired by **Gábor Buday**, Director of Science and Technology at PURAM and in charge there of stakeholder involvement and public information activities. He introduced the first speaker on Hungarian policy, actors and projects: **József Rónaky**, Director General of the Hungarian Atomic Energy Authority (HAEA). Dr. Rónaky spoke on *radioactive waste management in Hungary: policy, actors, projects*.

Dr. Rónaky explained that Hungary has had nuclear activities since the early 1960s. The four reactor units of Paks Nuclear Power Plant (NPP) commissioned between 1982 and 1987 form the most significant waste source today. Two research and training reactors also contribute to the generation of spent fuel. In each case fuel waste is temporarily stored on the respective site. Finally, 2 000 institutions using radioactive isotopes contribute to waste production. Dr. Rónaky showed a map situating the sites of major interest to the workshop. North of Budapest in Püspökszilágy is found Hungary's only operating waste disposal facility, the near surface repository for LILW institutional waste created in 1976. PURAM's first job in 1998 was to enhance the safety there. Today this shallow facility is almost full. Moving south, we find the Paks NPP where, likewise, a significant safety upgrade took place. In the close vicinity of the NPP locates the interim storage facility for spent nuclear fuel that assures a 50-year storage capacity for, irradiated fuels, affording to Hungary the time to take decisions on long-term solutions. Farthest south on the map is found Boda, a potential future site for final disposal. Boda's claystone formation is being explored from the nearby sandstone uranium mine which is well-known geologically. Currently, Hungary's most pressing need is for a new licensed facility to accommodate LILW coming now from the NPP. Responding to this need, a new subsurface repository is now under construction at Bátaapáti. (The FSC had the opportunity to visit this community later in the day.)

Dr. Rónaky outlined the provisions of Hungary's 1996 Act on Atomic Energy, mentioning in particular its requirement that fundamental information on science, technology and risk be passed on to the public. He described the segregated Central Nuclear Financial Fund (CNNF), based on contributions from the NPP during its operational lifetime. The CNNF guarantees that all foreseeable costs for long-term management will be covered, and in particular it supports local communities and their Public Information Associations.

Dr. Rónaky recalled that when the Paks NPP was planned and constructed, Hungary was under Soviet domination. The plan at the time was to store LILW on site at the NPP until the latter was decommissioned. In the early 1980s, exploration began in the nearby region to site a future repository. Public involvement was not in place, and stakeholder discussions were not open. Two siting efforts met strong public resistance. The best-known crisis took place at Ófalu, in the final hour of the Soviet-style socialist government before the change in Hungary's political regime. In 1989, the Hungarian Academy of Sciences resolved that the site was technically suitable but should not be chosen against the will of the local public. A long investigation process was then undertaken leading to identification

of the site at Bátaapáti, which gained both technical approval in 2003, and local political approval through a referendum in 2005.

Legal regulations and the institutional framework for providing incentives to communities were then explained by **Balázs Molnár** and **Ildikó Czoch**, of the Technical Administration of the Central Nuclear Financial Fund (CNFF) within HAEA. Their presentation covered two main areas: stakeholder involvement in licensing procedures, and the role of Public Control and Information Associations (in particular, the handling of financial compensations and incentives).

Hungary's Environmental Protection Act is applicable in the case of waste facility licensing, and organises public involvement in two steps. First, during a preliminary investigation phase, the public has 21 days to comment on the hypothetical "direct impact area" in which potential environmental impacts will be assessed. The area is made known by the project promoter through each relevant town clerk's office which in turn is responsible for making the local public aware of the announcement. The actual detailed assessment phase provides a second opportunity for comment, during public hearings held 30 days after publication of the Environmental Impact Statement. The comments may be taken into account by licensing regulatory authorities. The authors gave the example of Bátaapáti, where the first step had been successfully completed with relatively few comments; the environmental authority accepted the first preparatory licensing documentation in January 2006. At the time of the FSC workshop, PURAM was preparing the detailed impact assessment.

Regarding local Public Information Associations, the Act on Atomic Energy of 1996 provides that the licensee of RWM facilities will promote, support and assist these groups, whose primary role is to provide information to the population. A 2005 amendment gives detailed guidance on how the associations may employ information, compensation and incentive funds. Each one signs a contract with PURAM setting out respective responsibilities. The financial assistance provided by project promoters can be used for dissemination of information (including through the operating budget of municipalities), but also for "social monitoring and control" of a facility, and finally for regional or municipal development (the latter through separate associations if necessary). Today, there are four Public Information Associations, each established in the vicinity of a working storage facility, construction site or investigation area (see the table in Appendix 2 detailing the financial assistance provided to each one in 2005 and 2006).

Dr. Molnár described the role of the information associations in local confidence building. PURAM must provide access to desired technical and planning information. A large range of media are used to allow residents to gather information and monitor PURAM's activities: these include visitors' centres, exhibitions, local cable TV, newspapers and newsletters, study tours abroad, regular meetings with PURAM personnel, and environmental monitoring devices.

The combination of open, active information and significant financial support are seen to have resulted in high public confidence around the sites. When the 2005 referendum was held in Bátaapáti, 75% of registered voters participated, and 91% of the votes were in favour of the establishment of the repository.

Gábor Buday then came forward to answer questions from the FSC delegates. Many were curious about how the landslide result of the referendum could be interpreted. Mr. Buday responded that the first explanation for the vote is the honest and open way in which up-to-date information has been provided to the population. For 15 years, public consultation and information have been carried out in the greater Paks area. Involved townships have received over the past ten years a monthly publication containing eight pages of technical information and four pages on local life. Seventy percent of citizens surveyed read the publications and among these 85% find them useful. PURAM employees

are living in the townships, giving a face and credibility to the company. The financial grant to the community is also part of the successful relationship. Opinion polling over this entire period has shown a high level of local acceptance for the waste management activities and community presence. At the beginning there was local willingness to participate in the repository feasibility study process without commitment; support then grew when funding was negotiated.

Mr. Buday explained the meaning of "social control". It is active participation by members of civil society in the technical monitoring of activities. Each municipality carries out monitoring and control of the nuclear installations. The highest level of control is seen at operating facilities. At both the Paks plant and the Püspökszilágy repository, a trained municipal group performs regular control of incoming materials and carries out other measurements. Local groups are currently in training to perform this monitoring for the two future repositories.

The next speaker was Professor **Richárd Szántó** of Corvinus University of Budapest, who spoke about *the changed and changing decision-making culture in Hungary with emphasis on environmental decision making*. His analysis addressed the broader environmental context, rather than specifically the siting decision for a radioactive waste repository. Prof. Szántó informed the workshop of some emblematic cases of environmental decision making. Perhaps the best known concerns a dam on the Danube River that has triggered fierce discussions among bordering countries for the past 30 years. Local protest, risk-balancing and equity issues and/or durable trans-border conflict are found in the 180 cases of environmental conflict, collected from daily national newspapers by Prof. Szántó in 1999-2006. One third of these concerned waste of any type (hazardous, solid, etc.). The second largest category concerned service industry installations (shopping centres, parking lots, etc.), followed by infrastructure cases. The energy sector, particularly mining, focussed conflict, whereas the siting of industrial installations and factories yielded (perhaps surprisingly) the smallest number of cases. Most cases of conflict were concentrated in the central region around the Budapest agglomeration and extending to the Croatian and the Austrian borders.

Prof. Szántó remarked that after the political transition of 1990, Hungarian citizens gained more freedom to express their opinion. In the last eight years about 50 local referenda were held on environmental decisions; only seven resulted in approval. However, while apt to protest, Hungarians have not necessarily increased their participation in decision making in other ways. Even participation rates in local referenda – arguably the easiest way to get involved – are not high. Possibly this may be traced to another problem, i.e. the lack of connection between the consultation results and the outcome: facilities have been built even when the local population has refused them (and in two cases, facilities were not completed despite local approval). In fact, a more successful means of participation in Hungary is through pluralistic local monitoring commissions (examples include not only nuclear sites but also a cement factory).

While there are still political problems of environmental cover-up, there is greater professionalism today in the area of risk communication and public relations. Today policy makers and companies assign the jobs to professional PR agencies and attempt to take into account the communication and social issues rather than pure planning, economic or technical issues. This move towards openness is the most remarkable cultural shift.

Dr. **Anna Vári**, a principal researcher at the Hungarian Academy of Sciences Institute of Sociology, then reflected on *sociological aspects of the Hungarian nuclear waste management programmes*: *changing approaches and conflicts*. She noted that the period covered by Hungary's waste management history embraces the height and decline of the socialist regime, and the ensuing profound transformations in socio-economic structures. These evolutions, as well as international trends toward more inclusive governance of RWM, influenced the Hungarian management approach.

To trace the changes, Dr. Vári reviewed the public concerns and conflicts seen in five cases of siting. (A chronology of the five cases is visible in her slides, in Appendix 2.)

In Hungary, Dr. Vári suggested, a "technocratic" model of radioactive waste management characterised both the successful siting of the Püspökszilágy facility as of 1976, and the failed near surface repository project at Ófalu in the 1980s. In the first case, public concern focussed in the 1990s notably upon compensation and the place of incentive payments. It was felt to be unfair that Bátaapáti as a LILW siting candidate received more money from the central waste management fund than did the host of the operating facility at Püspökszilágy.

In the second case, local geologists opposed the choice of the Ófalu, not far from Bátaapáti, and were soon joined in protest by local residents. A secretive, top-down decision process created distrust. The local resistance, taking place just at the time of national political transition, mirrored that by taking on the character of a conflict between the Goliath of the nuclear industry and the David of the local population. The Hungarian Academy of Sciences found that the site geology was not unsuitable but remarked on the social unacceptability of the LILW shallow repository proposal. Tension at Ófalu was also compounded by conflicts between Hungarian local people and the substantial German ethnic minority residing there. Interestingly, those minority residents acted as whistle blowers: Dr. Vári learned in interviews conducted at the time that emigrants influenced by events surrounding waste management in Germany informed their Hungarian neighbours that waste repositories were very unsafe. In this way they contributed to a perception of high risk.

After 1990, Dr. Vári suggested, there was a shift from a technocratic to a "market" approach to siting. There was an emphasis on negotiated agreements between the implementer and local players. Financial incentives as well as public relations and information programmes have been major instruments in this approach.

Incentive payments and risk perceptions played a role too in local responses to the Bátaapáti siting for a LILW subsurface facility. The sociological context was comparable to that of nearby Ófalu, with complex socio-economic differences among ethnically divided populations. Of the settlements involved, six decided to co-operate and formed the Association for Social Control and Information (TETT), while five others opposed the facility. While they refused incentive payments, these communities considered that they should still benefit from identical levels of compensation because they shared the risk.

Another case is that of the spent fuel temporary storage facility in Paks, planned when as of 1990 the shipment of spent fuel back to the supplier (formerly the Soviet Union) broke down. An Association for Public Information and Oversight (TEIT) was created in 1992 (some 4 years before the Act on Atomic Energy formalised such bodies). PURAM founded an information campaign which Dr. Vári characterised as being of a "public relations" nature, as distinct from a "public involvement" model. Again, local economic inequity fuelled conflict, with opposition to the proposed facility joined by calls for price concessions on electricity for all local residents, even for those not employed by the nuclear plant. TEIT was able to bring together the affected communities and provided incentive payments negotiated between the NPP and the municipal government. (These incentives are typically higher than what the implementer alone is in a position to pay.)

A final case is that of plans for establishing a HLW repository in Boda. Here again, as of 1996 a group was created (West Mecsek Public Information Association or NyMTIT) allowing PURAM to channel incentives and information. With technical research phases started or stopped according to political changes, local concerns appeared to centre on the stability and transparency of national strategy as well as of incentive payments arrangements.

The local public in each case has a final vote regarding siting and financial packages, but Dr. Vári judged there appears to be little day-by-day participation at the local level, nor much interest on a national level – including a relative lack of impulsion by environmental non-governmental organisations (NGOs). Political scientists see Hungary as a youthful civil society where the willingness to participate and the habit of participation are not yet formed. This may explain a lack of dialogue on waste issues at the national level, but further factors may be that strategic documents are not made sufficiently accessible, that energy strategy has not been debated in the civil forum, and that Parliament has never made a decision directly on RWM.

Dr. Rónaky contested this vision and highlighted instances of national discussion and accessibility of documentation. In 1996, in connection with the preparation of the Energy Law, there was a national debate on RWM strategy in Hungary: academies and NGOs provided experts. The results concluded upon the basic principles now governing RWM activities. Each year, he added, Government sends a report to Parliament. The report is published in full length and in short popular form for public consumption, debated in commissions and plenary, and usually approved unanimously. As Hungary is party to the Joint Convention of the safety of spent fuel management and on the safety of radioactive waste management, a report for the international community on programme structure and progress is due every three years. Two such detailed national reports have been submitted and can be read along with the associated parliamentary debates on the HAEA website. Dr. Rónaky noted that these facts may be little known as they were little reported in the media.

The final talk, on the *value and lessons learnt from networking amongst Hungarian public associations and with outside experts*, was presented by Mayor **Gyözö Kovács**, for 16 years and 5 terms the mayor of Boda. Mayor Kovács is the chair of the West Mecsek Public Information Association, today comprising nine settlements located in the investigation area for the HLW repository and serving a total of 7 500 persons. The main task of the NyMTIT is familiarising the public with the underground exploration and research programme. As well, the association maintains an environmental monitoring network and fosters the protection, restoration and replanting of areas affected by investigation activities.

Mayor Kovács described some of the information initiatives taken by the association. It maintains a public information office where all documentary materials can be found. Meetings are held in each settlement, and a road show lasting one month visited eleven locations, providing information and establishing personal contacts. “Information parks” have been constructed; historic information is displayed on panels placed alongside walking paths. Schools visits to sites are organised in order to familiarise future decision makers with waste management activities. A quarterly newspaper, the West Mecsek Compass, is issued to each household free of charge. Each town also has its own monthly publication. Each one reports local news and developments from schools or institutions, along with the agenda of scientific and other meetings. This information is available on line. A cable TV network serves all these settlements, allowing real-time monitoring of the investigation sites.

Because civil society needs information from reliable experts to participate in waste management, the association contacted the Hungarian Academy of Sciences to provide input, including translation of the technical issues into everyday language and double-checking of environmental measurements.

Mayor Kovács also highlighted Boda’s participation in the EC-sponsored COWAM 2 programme. He stated that it was very helpful to learn from foreign peers about the thinking and practices in their countries. Because NyMTIT representatives have been active since 1996, they were able to make a particular contribution to the COWAM 2 publication “Roadmap for local committee construction”.

Two local organisations have become full members of the GMF, the European grouping of nuclear host communities and already hosted their visits. GMF acknowledged Hungarian efforts by

holding its presidium meeting in NyMTIT headquarters in the very first year of their joining. Local residents have made study trips and attended GMF conferences in several countries.

The NyMTIT gained access in 2006 to the lobby group of the Parliament of the Hungarian Republic. Mayor Kovács explained that the association can study and comment on new legal regulations before they are debated, and explain local positions to national politicians.

Public polls performed in 2003 and 2005 indicated a high level of awareness among local residents about the repository activities. Knowledge about the association itself dipped slightly between 2003 and 2005. This probably reflects the fact that information activities were somewhat diminished in that period. Mayor Kovács called this an argument in favour of maintaining communication initiatives in a stable manner. He also showed the importance of performing objective and reliable evaluation of the Association's activities, through such instruments as polls, to help foster ongoing confidence in this community resource.

Bátaapáti community visit

In the afternoon of the first day, FSC delegates visited the community of Bátaapáti, the site of the planned LILW facility,[1] to meet with community leaders.

The community visit included a tour of the underground facility under construction in Bátaapáti and a meeting with the village mayor, the school principal and the vice-president of the Association for Social Control and Information (TETT). Bátaapáti is a small village with about 450 residents, of whom 30% are under the age of 18 years. While rural, the village benefits from water, electricity, gas and sewerage. Years ago it used to be a village of about 1 000 residents, of which 800 were German-speaking. In 1946, much of this ethnic population left. The village itself struggled, but over time, families came from all over the country into the area. During this period the village was joined with another village in the area, and in 1990 a new history started when Bátaapáti became independent again and had its own leadership. The village decided that it would repair its roads and reopen the school because it wanted to keep young people in the area. The primary school, closed for many years, reopened. This allowed village children to attend school near their home and to avoid a daily 15-km journey to school. Many people in the village work in the winery or find jobs directly or indirectly related to the construction of the repository. While Bátaapáti is small, it has two shops and four civil organisations. Cable television gives residents access not only to entertainment, but also to detailed information on waste management activities.

The FSC found many reasons that contribute to the community's confidence in accepting the facility. There is a very good working relationship between PURAM and the community, which has grown over fifteen years. The fact that members of the community work in the facility gives the greatest confidence to the population, as these people interact with their neighbours daily. There is an agreement between PURAM and the village that the operating facility will employ local people. This provides added confidence in the long-term stability of employment in the area and prospects for a continuing relationship of trust with facility operators.

1. Construction license has since been received. The surface parts of the National Radioactive Waste Repository became ready in September 2008, and the authority issued the operation licence for the central and the technology buildings. With this first-phase operation licence it became possible to transport waste from the Paks NPP to the new technology building for pre-disposal storage. The first packages (2 00l drums with solid LILW) arrived at the end of 2008. At present (May 2009), tunnelling activities are in progress aiming at the construction of the underground disposal chambers.

Safety is the key concern for the community, who has confidence in the regulatory and licensing process, in part, because of the multiple agencies involved. The community believes that the repository will receive a license only if it is safe. The community recognises that technical issues are not their area of expertise and have brought in independent technical support. Additional confidence comes from the active involvement of the Hungarian Academy of Sciences on behalf of the community. The community believes there is a benefit from hosting the facility. At the same time, it also recognises that there will be impacts. One key impact, identified by the community, is the increased traffic associated with building the LILW facility. This results in increased noise, vibration and dust in the area. Discussions continue about mechanisms that would minimise or eliminate these impacts altogether. A new ring road has been proposed. In addition, an Environmental Impact Assessment will be prepared for the facility and will address these issues.

Another factor that builds confidence is the role the community will have as a guardian of the future safety of the repository. Members of the community will receive training to monitor both the waste coming into the facility and the facility's operations. The training will take a year and will give members of the community expertise to be able to scrutinise the facility. The community thus has a role in the working of the facility and the means to reassure themselves that everything is working as planned. Community representatives advocate on behalf of local young people, recognising that they will need job opportunities, and will need to develop corresponding skills and qualifications for those jobs. The community looks for assurances that its youth will receive job and training opportunities to enable them to benefit from the presence of the facility. Finally, the local oversight association is active in involving both the community and its neighbours in discussing issues with PURAM and raising their concerns. The Social Control and Information Association is instrumental in fostering agreement between PURAM and the local communities.

MAIN WORKSHOP

Opening of the workshop

On the second day, the full set of FSC delegates convened for the main workshop in the presence of local representatives and residents.

Dr. Claudio Pescatore greeted the participants and expressed his pleasure at seeing so many Hungarian and FSC delegates in attendance. He introduced the opening speakers. First was **Dr. Janet Kotra**, the Vice Chair of the Forum on Stakeholder Confidence, who officially opened the proceedings. She was especially appreciative of FSC workshop hosts and sponsors, past and present, whose dedication makes possible the most important work of the FSC: "learning to favour the safe management of radioactive waste through co-operation with stakeholders." The workshops provide unique opportunities to come together and interact with international counterparts and national and local stakeholders. All are dealing with difficult decisions involving not solely technical or scientific judgements but also societal choices as well. Making or failing to make such decisions has importance for those here now but also for future generations. The FSC has already published documents on "stepwise decision making" and seeks to discover how the full range of stakeholders can be included since they are affected differently; especially those most affected can inform the decision making process at various stages. At FSC workshops, the roundtable discussions are particularly valuable, for it is there that lessons are shared from each one's experience, thereby contributing at least indirectly to more equitable, robust and durable outcomes. Dr. Kotra hoped that Hungarian stakeholders would find this format stimulating and helpful, and thanked them in advance for their willingness to be candid, to educate their visitors and to contribute their reflection.

Dr. Kotra observed that confidence cannot be created where there is none, but meaningful and equitable opportunities worked out with local residents can help develop trust among partners of good faith. She pointed out that the FSC has identified ways that a facility can enhance rather than detract from quality of life and indicated that this theme would be discussed at the workshop (during the presentation of the "Value Added" theme and the upcoming report[2]).

Dr. **Takanori Tanaka**, NEA Deputy Director, expressed his thanks to representatives of PURAM, HAEA, Paks NPP and particularly the local municipalities for their presence. He presented the NEA and highlighted the place of the Forum on Stakeholder Confidence in the programme of the Agency's Radioactive Waste Management Committee.

Dr. **Mariano Molina** then took the floor as a representative of the last workshop host, Enresa in Spain. The 2005 workshop in L'Hospitalet came at a very important juncture in Spain. The decision to launch a siting process for a Centralised Storage Facility for HLW had been already made and former approaches to public participation and waste management acceptance were recognised as no longer

2. The published report is NEA (2007) *Fostering a Durable Relationship Between a Waste Management Facility and its Host Community*; *Value Added Through Design and Process*. Paris: OECD.

valid. In this respect, Dr. Molina explained, the pluralistic research programme COWAM proposed a new methodology aimed at the siting of radioactive waste management facilities where different aspects of local participatory systems, institutional framework and multi-level decisions processes and long-term governance were integrated. He spoke of the benefits in the Spanish context of having had the informal "peer review" constituted by an FSC workshop experience. Dr. Molina encouraged the Hungarian workshop participants to draw as much as they could from this opportunity to get friendly and penetrating feedback from their international counterparts.

Finally, Dr. **Elizabeth Atherton** of UK Nirex and the FSC Core Group recounted the previous day's community visit to Bátaapáti and what had been learned there from local leaders (reported above).

Implementing a regional development plan in step with radioactive waste management facility development

The workshop continued with a session entitled "Implementing a regional development plan in step with RWM facility development". It was chaired by FSC member **Anni Bölenius** of SKB, Sweden.

Dr. **László Tistyán,** Director of the Fact Institute of Applied Social Science Research, addressed the *legality and legitimacy of RWM policies.* "Legitimacy" is a feature of political order. Something legitimate is deemed to be appropriate, and its acceptance follows without further question. Dr. Tistyán explained that legitimate process and authority can be found at home, at work, and wherever the existing order is completely acceptable and persons obey and accept directives or orientations without the use of force.

Important infrastructure investments like RWM facilities must undergo a *process* of legitimisation, which relies on three components. First is the political discourse or public communication which targets the acceptance of the given situation. Second are the institutional arrangements created for the project. The third component of legitimisation is the visible product, result or performance. Legitimacy may be called into question if there is contradiction among these different components. In this way, the apparent disorder found on early RWM facility investigation sites contradicted the discourse according to which a facility would eliminate any physical risks. The "metamessage" weakened legitimacy.

Dr. Tistyán suggested that in Hungary, there has been a typical misunderstanding of the legitimisation process. Responsible actors assumed that if a given investment is professionally justified, there is no need to support it with political or public communication. However, the professional content is only a very small part of the information needed by the public. In each situation and region the adequate content will be different. He also drew attention to a formalistic fallacy: institutions may consider that legitimacy is established, when simply procedures have been observed without substantive outcome ("We will speak for a given period and exchange information even if consensus is not established").

Dr. Tistyán observed that a legitimisation process is not isolated from other processes in society; when cultural communication is typically conflict-centred, as he suggested may be the case in Hungary, then this could set a counter-productive precedent for legitimisation discussions. He posited that consensus is needed rather than conflict. Consensus cannot be reached without a first step consisting of identifying a basic common framework of understanding (for example, on desirable goals or priorities, which would correspond to an acceptable outcome situation). Such a framework could be provided by national policy. For instance, Hungarian people may not often stop to consider the relationship between consumption and waste, and become aware of the problem only when a municipal (or radioactive) waste disposal facility is to be sited. Then it becomes a personal issue of conflict with desired goals for one's

home region. Clear national policy and a consensual framework for understanding the issues (resulting from debate) could serve as a basis in legitimating disposal plans.

Not only a shared framework and appropriate social processes, but also appropriate actors are needed in legitimisation. Dr. Tistyán pointed out that the various competing interests and their representatives must be identified to take part in the process, which should support them in envisioning even situations where they may not gain an immediate advantage. The Aarhus Convention provides welcomed support for stakeholder dialogue, stating that affected publics cannot be excluded. However, the definition of "affected" must be worked out (it could depend on geographic radius or on vested interest). The ability of stakeholders to effectively represent their constituency on a given issue should also be checked; for instance, it is frequent to hear self-proclaimed protection of "the public interest" when financial interests in fact may be in play. Democratically elected representatives have a defined mandate and perhaps should return to their base to get an extension of that mandate for specific legitimisation discussions.

The overall message is that the rules of the game should be agreed and transparent. The session chair observed that it is indeed important to establish a continuous legitimisation process as a RWM project passes through different stages. As a communication officer, she was glad to hear the speaker's emphasis on organising communication "adequate for all the concerned parties," and commented that this is sociologist and economist Max Weber's point of view.

The next speaker was Ms. **Ada Ámon**, of the Energia Klub (Energy Club), an NGO. She spoke on the subject of *local, regional and national interests.* Ms. Ámon stated at the outset that she is "one of the minorities in Hungary against nuclear energy production both here and in the world, in part because we can't really do anything about the waste generated in this process." Acknowledging that many different types of waste were under discussion at the workshop, including LILW to be disposed of in Bataapáti, she specified that HLW from electricity production is the major problem in her view. She told of personal observations suggesting that villages (in Russia) and their inhabitants may be suffering today from ill effects of inadequate HLW management. Ms. Ámon expressed scepticism that a solution will be found for dealing with waste that remains dangerous for ten thousand years. In order to bring home the timescales, Ms. Ámon pointed out that if Renaissance King Matthias – who made Hungary into a major power in the 15th century – had had a nuclear power plant, some parts of the LILW from that plant would still be toxic. If the Cro-Magnon had had a plant, we would still be keeping their waste in a long term repository.

Ms. Ámon observed that the "NIMBY" effect exists in Hungary but is no longer seen in connection with RWM facilities. Recognising that this is perhaps positive, she still felt that the fact is strange. Her confidence is not improved by two recent statements by a State organism that monies from the central nuclear fund had been disbursed not for common purposes, but had "disappeared". Until last year, she pointed out, legislation limited the local uses to which this fund could be put: money can be used for communication and information activities, and transferred to organisations working in these areas. However, in November 2005, the political proposal was made that spending can be extended to the general municipal budget of host communities and to regional development projects. Ms. Ámon questioned the legitimacy, if not the legality, of such extensions. She regretted that there was no transparent and common agreement on how confidence-building sums of up to 800 million forint (a little under 3 million euro) per year should be spent, for the good of all.

Other questions are asked by the Energy Club as well, and the organisation feels that answers are opaque: For how many years will radioactive waste be produced at Paks? Will the plant lifetime be extended? How many reactors will be constructed? Are repositories to be limited to Hungarian-produced waste only, and what guarantees can local people obtain on this score? Ms. Ámon pointed out that spent

fuel can be left in place in the interim storage at Paks for about 40 years, but pronounced this period insufficient to identify and license an adequate repository site in a small country like Hungary. To support her claim, she cited cost overruns and unexpected outcomes in other countries' waste management programmes. For instance, in 2004 the United Kingdom, an experienced country, estimated that 48 billion pounds sterling would be needed for decommissioning and dismantling projects, whereas 70 billion were effectively needed; this is practically the annual state budget of Hungary.

Such observations bring Ms. Ámon to insist on the need for the local and national community to participate in debate on what she termed "mission impossible", and to find ways of addressing issues which up to now may not have been fully considered. Among the important questions are how we can pass the message along to future generations so as to protect them from the dangerous materials isolated in a repository, and how to achieve retrievability. She ended by arguing in favour of a rapid end to nuclear power.

The session chair agreed that waste is dangerous if it is not properly managed. She said that some scenarios had been brought up in this talk that no participant would like to see, and that the RWM community is working to address the issues in an open manner.

The workshop was then addressed by Mr**. György Edelman,** Mayor of the town of Kisnémedi, the village closest to the Püspökszilágy near surface repository. He described *national and local interests as seen by the local administrator*. Mayor Edelman took a historical perspective on decision making, pointing out that decisions, like installations, may be compliant with the standards of their time, but must be revisited to comply with present-day requirements.

In 1996, the first Act on Atomic Energy was passed unanimously by Parliament, with provisions for "communication". Mayor Edelman contrasted the level of communication represented by written information, or by local persons' ability to enter a facility and debate with those working on site. In 1990, he said, there was a shift in Hungary from reliance on expert opinion, to a new process in which PURAM and local mayors could debate the issues. "Public control" was established for the first time.

Mayor Edelmann then defended the necessary modifications that have progressively been made to the legislation. He pointed out that Bátaapáti and other settlements in the vicinity of sites agree to carry an extra load for the nation and logically seek extra services. The amount of 800M HUF, he said, is not much money in a municipal budget. Mayor Edelmann concluded with the remark that on Day 1 of the workshop, participants had learned that the local people were convinced not by force but by arguments.

Finally, Mr. **Zoltán Ferencz**, of the Hungarian Academy of Sciences (HAS) Institute of Sociology, presented surveys describing v*iews of the local and national public on RWM issues.* He examined results obtained over the years 2001-2005 by HAS, from national and smaller surveys commissioned by PURAM in each of four RWM localities. He also called on findings from the 2005 Euro barometer focussing on nuclear matters and radioactive waste disposal, with appropriate caution given the differences in methodology.

The combined survey data suggest a remarkable increase over the period of 2001-2005 in Hungarian support for nuclear power. This apparent trend seems puzzling since no major events or informative national debates took place during the period, and a 2004 debate at Paks even revealed predominantly negative opinions about the nuclear option. To interpret the high 2005 Euro barometer result, Mr. Ferencz cited the classical findings of sociologist Pierre Bourdieu, indicating that people can have an opinion about anything even if we have no direct contact or do not participate in social discourse about it.

Oil dependency reduction increasingly emerged as a serious argument for nuclear power for the general Hungarian public. Still, renewable energy sources remain the most desirable, even in Boda where radioactive waste has become a familiar matter.

Mr. Ferencz reviewed residents' preferences for siting methods. He showed that "best suited technical parameters" are seen across local surveys to be the foremost criterion for site selection. Interestingly, the Hungarian public still considers favourably the "export" solution (waste to be transferred out of the country, as was formerly the case in countries buying nuclear fuel from the Soviet Union).

In the two regions (Boda and Bátaapáti) where new RWM disposal facilities have been proposed, surveys do not show much evolution over time of acceptance for the facilities, but the proportion of residents who formerly expressed "fear" seems to shift in later surveys to the category of "neutral" attitude. Data in all four municipalities indicate that there was very great desire for a referendum as a method of local consultation.

Residents agree strongly that people's health should not be traded off for financial benefits. Importantly, persons in the four settlements differ in their perception of whether compensation is indeed a manner of "buying" residents' approval.

Mr. Ferencz ended with suggestions for harmonising surveys conducted on different levels (local, national, international). He pointed out that these different instruments can be valuable if they are interpreted with sensitivity to Hungarian specificities.

Following these presentations, roundtable discussions were conducted. These gathered FSC members and Hungarian stakeholders from the local scene, including elected representatives, municipal workers, teachers, bank employees, farmers, public relations experts, medical personnel, nuclear plant workers and a sports champion. The participating mayors represented in total some 80 000 Hungarians.

The conclusions of the Session 2 roundtable discussions were reported in plenary.

Roundtable discussions – Implementing a regional development plan in step with facility development[3]

The roundtables grouped FSC delegates and Hungarian stakeholders, both local and national. Each table had the help of a translator.

In this session we discussed the following questions:

1. Can a local/regional development plan be successful without an approved national policy for RWM?
2. How do local people feel about solving a national "problem"? Is it fair?
3. How does one assure the long-term stability of development mechanisms? How can one assure that promises will be kept? How much flexibility should be kept in the development plan?

The following summarises the reports by the eight round tables.

3. Reported by Anni Bölenius, Swedish Nuclear Fuel and Waste Management Company, Sweden.

Local development plans and national strategies

Most tables seem to think that having a strong national policy on RWM issues is necessary in order to make progress on the local level. Without national policy and support it is hard to convince people at the local level on the necessity of RWM.

The question is how strong is the policy that exists in Hungary today? It seems as if many people at the local level think that the policy exists, but that it is not very strong, not very well known and that some important aspects are missing in it. For example, damage issues as well as responsibilities should be clearly expressed in the policy. Thus, the question was raised whether you can call the existing law a policy.

Stronger policy would support local planning and add to the legitimacy of the process.

There are some hopes that the new law will include some of the aspects that are missing and thus help the communities. It was recognised that with these changes, there is a possibility to build up a "bottom-up" – planning with proper financial resources (the role of associations). There were complaints regarding lack of local/regional plans when the NPP was sited.

Help or support from international level (EU) was welcomed (in terms of policies and guidelines).

The importance of sharing experiences with other stakeholders with similar issues in both Hungary and in other countries was seen as essential, as these things were not easy to handle and seeing how others manage the challenge can be inspiring.

About legitimacy and the ability to give information to the public

Members of the public who have not been involved in the process and have not built up their knowledge may not think the process is legitimate. This may be because of lack of information.

Lack of stability of political situation at municipal level is yet another obstacle when it comes to ensuring continuity of the information.

Sometimes the depth of information received at the local level is not sufficient or information is not available when it is needed to enable the associations to help their communities.

There are different levels of information available. If the public asks for information they might get a press statement. In the Associations, detailed questions can be raised and addressed. However, the groups do not always know what to ask.

The way things were done in the past still affects societal issues and projects. It also only developing in Hungary and it will take time to change this.

How do local people feel about solving a national problem? Is it fair?

Most local stakeholders do feel that they help in solving a problem from the whole nation and for this, they of course should be compensated. But the word compensation created a lot of discussions, as compensation can include many things. It could be pure economic compensation to the municipality which can, by using this money, increase the living standard in the municipality. For other stakeholders, compensation meant money received from the Waste Fund, as for example in Sweden, to cover costs for the municipality to work with this issue (meeting, seminars and workshop like the FSC workshop etc).

There is a paradox in the word of compensation – as it might lead people to think that the municipality actually accepts a risk and for this, they get money. Some stakeholders feel this is counter-

productive, as it is might lead one to assume that a municipality would be prepared to be "bribed" and risk the health of their citizens for money. It all seems to come down to what risk there really is.

Some tables considered that for conventional risks such as accidents in construction or dust from a construction area, similar claims should be addressed to other industries as well. As radiation risks are widely regarded to be minimal, why does the nuclear industry in particular attract such claims?

It is important to point out that the local stakeholders strongly oppose to the idea that they would be "the fools of Hungary". These municipalities are not dumber than any other politicians they see what's in the interest of their citizens. They are carrying the load of an RWM facility and believe that their municipality is suitable for this purpose. They want and expect support for this activity. One table made a comparison of a marriage: you have to engage and to commit… and wait for the results. Radioactive waste is not a joy, but what comes out of it for example, good and constructive co-operation with PURAM, where both parties' interest can be fulfilled – can be seen as "the child" of this long-term commitment.

Local participation and regional development

The workshop continued with a session entitled "Local participation and regional development". It was chaired by FSC member **Evelyn Hooft** of ONDRAF/NIRAS, Belgium.

Mr. **Balázs Kováts** of the Paks Nuclear Power Plant opened the session by *looking back on how public associations were set up and affected regions defined*. He recalled that the Paks NPP, a major achievement of Hungarian technology, was constructed in the 1970s when Hungary was under what he called a dictatorship. When the political transition took place in 1989 and 1990, civil society wanted to get involved in decision making about nuclear energy production, even writing to Parliament asking about possibilities for such involvement. The Paks plant managers responded to the call for partnership with local residents and met with mayors in the vicinity. After a long debate on the geographical scope to be comprised in an Association for Public Information and Oversight (TEIT), a radius of 12 kilometres around the plant was chosen, extending across the Danube. The association at this time won the right of access to Paks NPP and later to PURAM documents.

TEIT's meetings every month allow PURAM and Paks plant staff to encounter a variety of civil society representatives. TEIT's role is providing citizens with information from industry, and feedback to industry if there are problems or rumours in townships. In that case NPP directors provide an interview on local TV. PURAM organises lots of open door events. In this context, "no one can say that Paks NPP or PURAM keeps its plans or problems secret." Mr. Kováts attributes the positive referendum in Bátaapáti to the similar 16-year history of co-operation between settlements and the implementer within Bátaapáti's TETT.

Joint decisions are taken with the mayors on real issues of control, including monitoring. Fifteen years ago villages surrounding the plant were equipped with meters so that citizens and mayors themselves can perform the measurements of environmental radiation levels. Two stations take background measures near Paks and across river; the system also uses a satellite station. In this way TEIT and its institutional partners assure information provision at the highest level. Over the years there has been continuous publication of measurement results, including background levels (the "green baseline") at the time of NPP construction.

Gábor Buday then gave PURAM's view on *local communities' interests and ways to achieve their goals*. These interests can be described as safety, security, partnership and economic benefit, and social peace. Safety is the universally agreed priority. Waste must be stored/disposed of in such a way that no radiological consequences above set limits are to be found near or far. The first step in

checking safety lies in the licensing procedure, where the regulatory authority plays a central role. Another crucial layer of safety control is that assured by the local information associations, as described in the preceding presentation. Local people also play a guardian role which, combined with physical barriers, lend a sense of security (important in the aftermath of 9/11).

Mr. Buday spoke of the principle of host region partnership and benefits. It is in the national interest, he pointed out, to have the social oversight and information organisations, just as the waste management facilities represent the local solution to a national problem. The budgets connected to the facilities and the associations are legitimised by the Act on Atomic Energy. One may note that other public interest installations (dams, prisons, etc.) do not benefit from incentive or compensation arrangements, but history has decided otherwise for nuclear installations. Mr. Buday pointed out that the word "compensation" is inappropriate; it suggests that "a mistake has been made", rather than framing the question of economic development interest. There should be no decrease in property values in the affected settlements, and environmental quality should be comparable throughout the region. Waste facilities produce an increase in employment. Quality of life is preserved if objective targets for nuisance levels are met. Finally, social peace is desirable but it is more properly a measure of how well other goals have been attained, than an aim.

Balázs Kováts again took the floor to speak of *regional development initiatives*. For 25 years, Paks NPP has generated electricity and is the central supply source providing 40% of national supply. The last non privatised national utility has a determining role in bridling energy prices and controlling inflation, and is a major employer. Looking beyond its legal obligations to society, the plant has responded over the years to requests of financial support for projects ranging from laying pavement to building kennels, but as of 2005 sought opportunities for providing realistic sustainable support to the region. The municipalities and settlements today can meet their needs with formal tenders; they need backing to participate in EU funding competition. The Paks NPP thus provides the backing share for neighbouring municipalities so they can participate in EU regional grants. For every euro provided they gain 4 or 5. To build regional competence Paks Ltd. also funds training courses on EU membership, venture start-up techniques, and environmental protection.

To maximise regional gain the NPP created a leverage fund exemplary in Hungary, aimed at development of the broad area and open for participation by municipalities, settlements, economic and civil society organisations. Paks Ltd. in course of five years will provide two million euro per annum to this fund. All organisations within the 12 km radius are eligible within limits set by yearly thematic criteria and objectives. This special fund received 174 requests in 2006 and 95 grant winners brought seven million euro into the region, a record in Hungary.

Dr. **Ferenc Wekler,** MP gave a second perspective on *regional development initiatives*. As a former organiser of local resistance to the Ófalu site selection, he measures the distance travelled in 20 years to the successful and desired siting at Bátaapáti. He observed that the Hungarian public has matured and can debate about these issues and is strong enough to recognise its interests and stand by them.

As special commissioner appointed by the Prime Minister, Representative Wekler is proud of his role in bringing parliament to a unanimous agreement on new provisions for waste facility siting. For instance, if any additional risk or burden is imposed on a waste facility hosting community, then the proponent has the obligation to provide additional compensation for that. MP Wekler's commission also rectified the rule according to which the local oversight associations received significant budgets for "information and communication" while basic village infrastructure needs went unmet. Parliament agreed that the funds can be used for operational costs and regional and town development.

Dr. Wekler agreed with Mr. Kováts that local mayors are not happy about broadening the range of actors eligible for grants but this is only, he said, because it spread resources thinner (funds contributed by the NPP did not expand proportionally). He ended by voicing the wish to continue co-operation with mayors to see what other possibilities such a big industry can offer for regional economic development and cultural development (training and education).

Mr. **Miklós Miszler**, Managing Director of the Agency for the South-Transdanubian Regional Development Council, then spoke on *development plans and conditions for joining*. As the region is poorly developed in comparison with other Hungarian regions, the most important target is to close this gap. The strategy chosen is to promote green industry in the energy, cultural and health sectors. In a bottom up process, involving a complex partnership with civil society and settlements, the agency helped draw up six development plans to benefit all areas within the region. Themes and projects to be addressed by EU grant requests were prioritised. The first priority is city-centre industry development. Micro-centres should be fostered, from which all other development ideas will flow: these could include industry parks, greenhouses or network ventures. The second priority is tourism readiness. In 2010, Pécs will be a European Capital of Culture and in the southern part of the region Lake Balkan can become a major attraction. Healthcare, social policy issues and training needs form the third focus. Finally, the fourth priority covers environmental protection (including brownfields clean-up) and transport development. The region is currently the only one in Hungary not served by auto route.

One thousand proposals were submitted within two months, and the total number reached 4 000. While it is impossible to support all, this rate shows the motivation provided by the regional plan and the eagerness to develop competitiveness and new employment opportunities. An Action Plan 2010-13 will be prepared, issuing tenders for small regions and settlements; not everything will be decided in competition.

Mr. Miszler outlined the contract concluded with Paks NPP in 2005. Support will be offered for participation in European innovation projects and for regional development targets to the extent that these can be harmonised with EU grant calls. The Regional Development Council is permanently invited to Paks activities and in return keeps the plant management informed of project proposals. Treating radioactive waste disposal as an opportunity rather than a liability, the Council planned to hand over to the plant an appropriate package of priorities and project ideas in time for 2007 funding.

Roundtable discussions – Local participation and regional development[4]

The roundtables addressed the following questions:

1. What are the opportunities that a RWM project could offer to the region? Are they only economic opportunities?
2. How to enable local communities to identify their interests and achieve their goals?
3. What conditions or support are most important for a local community at the time of joining a waste management programme?

A rural region gains from an influx of skilled workers and from skilled employment opportunities. This opens up educational specialities, raises education levels and increases pride. Increased opportunities in the village mean people stay in the village and children can have a local school to go to. The village becomes more sustainable over the long term

Heightened economic activity attracts new investments. The community and region hosting a RWM project should look for diversification and think about how to integrate a territorial

4. Reported by Evelyn Hooft, ONDRAF/NIRAS, Belgium.

development plan. This is part of looking beyond the short term (for opportunities should continue to be offered to future residents).

Tourism is likely to increase along with other economic development (40 000 people visit the Paks NPP; people will also visit the repository). It is important to address local infrastructure needs (and coordinate, for instance, with the hotel industry). Both tourism and other activities depend on regional and inter-regional infrastructure as well: good transport links with other centres.

The small community should prepare for expansion. It is wise to foster opportunities for socialising and make sure that social values have a chance to evolve gradually rather than abruptly. Town facilities for social functions are important. The roundtables took note of the positive role played by each of the Social Control and Information Associations in binding people and settlements together.

People visiting the facility may also visit the other attractions in the area. A vision should be developed that takes into account the specifics of the region (like wine growing and mineral water in the Southern Hungary area). Similarly, communities could work out a plan for their area for the next 100 years. This recognises the role they are playing. Among the ideas raised for helping a community to sustain itself was: setting aside land so young people can live in the village and raise their families. Funding should be secured for these planning efforts (as well as for the projects and actions they imply), and sufficient time to work out the vision in a deliberative manner.

There is also a need to work out non-economic needs the community will have. The roundtables identified these as: openness, access to information, increased knowledge and understanding, including on environmental issues. The community should have funding to help secure information or studies on the issues that may come up during the hosting process. It will be important to keep track of how people feel about their community and its external image.

Building a sustainable facility

On day three, FSC member **Steven Chandler** of the UK Environment Agency chaired a session on "Building a sustainable facility". He opened with an introduction to the FSC report "Fostering a Durable Relationship between a Waste Management Facility and Its Host Community; Adding Value through Design and Process".[5] The study by the FSC looks beyond the basic function of a waste management installation to examine how it can contribute much more of value to a community. Within this session, a perspective on the subject was to be offered by local mayors and PURAM.

Mayor **György Edelman** of Kisnémedi, Chair of the information association near Hungary's oldest and only operating (LILW) repository at Püspökszilágy, considered the question of *how can a repository be made attractive to the community for the long run?* An advantage found is that host settlements are well known throughout Hungary and abroad. In return, this reputation has made it possible for settlement stakeholders to exchange vital information with local people dealing with similar tasks (for instance, the Isotope Information Association learned from Gorleben residents how financial support facilitated local development). Mayor Edelman stressed the importance of credible information, which he felt comes most naturally from local residents of the communities dealing with waste rather than from outside parties, and from elected people rather than industry representatives. He also cited tools in place to provide reliable local information, such as a computer-based monitoring system providing data continuously about background radiation, from which measurements are broadcast on the 24-hour local cable channel.

5. Available online: *www.nea.fr/html/rwm/docs/2007/rwm-fsc2007-1.pdf.*

Mayor Edelmann also commented on how the reform of the Act on Atomic Energy has improved local ability to use and receive financial resources for the additional tasks linked to facility hosting and for development. He pointed out a consensus on the need to manage radioactive waste from nuclear energy production in Hungary, rather than shipping it to other countries. It should be taken as starting point, he emphasised, that a community undertaking the solution of this national problem should receive moral appreciation and financial support. Mayors, he suggested, can make proper decisions on the use of these finances for the benefit of the people living in the settlements.

The next speaker, Mayor **Szilárd Krachun** of Bátaapáti, described the *basic expectations by local people for community monitoring and oversight.* His settlement counts 450 residents. Mayor Krachun explained that Bátaapáti got in touch with Paks Nuclear Power Plant in 1990. Following an unsuccessful attempt, new exploration work had been launched to find a suitable site for the construction of a disposal facility for the low and intermediate level wastes of the power plant. The leadership of Bátaapáti was open for dialogue: if exploring local granite for an underground repository and subsequent implementation resulted in mutual advantages (employment, local taxes…), they could allow exploration to start. It was specified in the settlement's consent that they were entitled to terminate, in any phase of the exploration and without any justification, the agreement made with the Paks plant. Bátaapáti stipulated as well that settlements should be kept informed of all exploration-related issues, without any taboo. It was seen as very favourable for safety that PURAM was created as an independent waste manager, free of any conflict of interest that might be experienced by a nuclear plant handling its own waste.

In 1997, the Social Control and Information Association (TETT) was set up with the involvement and joint leadership of seven neighbouring settlements in all. The intent was to relieve what Mayor Krachun termed the strong fear, the opposition of the population and tension that were typical to the region at the time. These neighbouring settlements were involved in the control activities from the start. The association decided to call on professionals capable of controlling the exploration work and guaranteeing in this way the quality of the technical site selection. To ensure transparency TETT leaders thought that the experts should not be invited directly by the association; instead they asked the chairman of the Hungarian Academy of Sciences to assign an expert committee. Three scientists thus perform the technical control while settlement leaders are responsible for economic policy issues and "getting the best for their communities."

Mayor Krachun pointed out that the public is continuously kept informed of the work that is carried out. Settlement mayors carry home information from regular association meetings. A regional monthly is delivered to 15 settlements and a monthly TV programme entitled TETT News is broadcast by the seven member settlements through their cable TV networks. As well, many citizens of the settlements work in the exploration programme which is the area's second largest public works contract. These citizens know exactly what kind of activity is conducted and so, Mayor Krachun claimed, it would be impossible in such a context for anything "secret" to be kept apart. There is confidence among the actors in the safety of the repository undertaking and in their ability to solve problems together. It is based too upon the 15-year friendly relationship with the Paks plant, by the fact that the need for a bypass road is now being discussed and addressed, and by gestures like that of the head of the repository project who built and moved into a house in the settlement.

A referendum was held in 2005 in Bátaapáti regarding whether or not to host a repository. Mayor Krachun credits good communication with the result that 75% of the population took part in the referendum, and 95% of this number voted for the construction of the facility. In the autumn of 2005 the Hungarian Parliament decided with one dissenting voice in favour of the construction. The waste

transport is expected to start in 2008 or 2009.[6] Simultaneously with the start of the transport, a civic body set up for controlling the waste shipments will start to function. The members of the control committee will be delegated from civil society organisations based in the settlements and trained for the job of inspection. They will be responsible for randomised, on-demand radiological control measurements of waste packages. They will compare resulting data with the expected data as recorded in the waste register or "passport" accompanying the transported waste drums. PURAM will have the ability to open and verify drum content. Mayor Krachun expressed interest in participating in this monitoring himself.

Some have voiced concern that tourism may die out in the region once the repository is opened. The mayor finds it significant that more than 2 000 persons to date had visited the exploration site and shafts. The planned visitors' centre will play a very important role in meeting this demand when the installation can no longer be directly toured. Visitors should be able to learn how the waste management and control process works and why the facility was sited at Bátaapáti. "Then the whole mystery will clear out."

Mr. **Attila Szabó**, Stakeholder Relations Expert at PURAM, considered *how to build an attractive installation and neighbourhood.* Two PURAM sites are located in Bátaapáti and the third will be the visitors' centre. In eight years of operation, the company obtained experience by developing seven show rooms, smaller visitor centres and open air information parks. A new challenge is faced now because the repository facility and the associated visitor centre will be constructed in Bátaapáti as a "green field" project in the Duna-Dráva National Park, within a reservation area, in close vicinity to walking paths and near the venue of active leisure programmes (hunting, fishing, orienteering competitions), within sight of the settlement. While these latter aspects are not under PURAM's responsibility, they mean that the company has to "think larger" and find the means to "live with and treat this living region well."

The hilltop selected for the site of the visitors' centre and the outlook tower provide a good view for visitors over these components of the land and, in fine weather, as far as the seven TETT settlements. On site, the design of the building, the wood and stone materials used for the construction, and the orderly maintenance of the numerous environmental monitoring stations must all suggest that the radioactive waste repository adapts itself to the land in an environmentally friendly manner. The main guideline adopted for building the facility is "openness". Visitors have to see clearly how well-managed the site is. PURAM is building fences through which people can see all outdoor processes (e.g., waste transportation to the site and into the chambers). At the same time, the installation must convey that it is safe, and that the protective barrier guarantees that no unauthorised persons can enter. Most importantly, there must be no interchange between the waste and surrounding nature over the period of protection sought. All these aspects of safety are important for the local people.

These principles will guide the very design of the visitors' exhibition, constructed in the round. Information regarding the generation, the packaging, and the disposal of the waste, the operation of the facility, environmental monitoring, and the interrelations between the geological environment and the social system, is provided in the centre of the show area. This information due to visitors will be encircled by the presentation of local flora and fauna. A small spring, called "the Mother" in local legend, was preserved during the exploration work and water can still be drunk from the well. A demonstration path with outlook tower, an open-air resting place and fireplaces with barbecue grills will also be provided for the visitors to allow them to enjoy a full day in the area should they wish it.

6. Indeed this did begin in the final trimester of 2008.

Mr. Szabó confided his hope that these plans not be "a simple fantasy" but that it will be possible for families to spend a whole day in green setting. He conceives of the visitors' centre as a cultural focal point for the region and a venue for scientific conferences as well. This investment, he pointed out, has as its direct goal to show today's visitors what happens here. As such, the centre will be a good learning platform and window onto West Mecsek Public Information Association (NyMTIT) activities. The centre will have a long-term information function as well in the context of high level waste management. This area on the hilltop, Mr. Szabó concluded, has one task: openness, and in this goal it shall not reflect any isolation. He expressed his wish to invite the FSC to the opening ceremony at a future date.

Mayor **Gyözö Kovács** of Boda reflected on the *information necessary for the local level to create a sustainable relationship with an implementer and a regulator*. The mayor heads up the NyMTIT, which has functioned since 1996 in "continuous contact" with a membership first of 6 and today 9 settlements counting some 7 500-8 000 people. He recalled that in 2000 exploration work was suspended and the area's uranium mine was closed and thus, the research laboratory operating in the mine was also decommissioned. The exploration work was resumed in 2003, and its area increased, resulting in the inclusion of three more settlements within the association of affected communities. The basic activities of the association include environment protection, communication about the exploration work, civil defence, regional development, the establishment of international relations, exploration-related training, contracting with PURAM, co-ordination of the use of the received funds, representation of the settlements' interests and the involvement of civil society organisations in communication.

As mentioned in the mayor's presentation on Day 1, the NyMTIT signed an agreement with MTA (Hungarian Academy of Sciences) to provide for the co-operation of three well-known scientists in communication to the public; they translated the research documents and data written in professional jargon into a more understandable form. These scientists take part in and give presentations in public forums and review professional documents submitted to the association. The scientific consistency of professional documents and research reports, Mayor Kovács commented, is a very important factor in public acceptance.

Contractual arrangements for communication, co-ordination, and organisation work were concluded with two local civil society organisations (Zsongorkő Friends and the Zöld Völgy minor-region association). The mayor observes that the dialogue with the public is much more direct with the involvement of these stakeholder organisations. He calls such arrangements "the most important component of establishing and maintaining the communication relationships," since messages can quickly be transferred to the concerned group of population through these relays and with the help of the media. The feedback to NyMTIT then can only be direct, quick and authentic. This helps fine-tune public opinion polls to gather views among the broader population. Mayor Kovács concludes that the appropriate persons and organisations should always be involved in the communication work and objective information should always be provided. This will ensure the full confidence of those living in the region.

Mayor Kovács described his settlement and the surrounding region as versed in nuclear knowledge and culture, stemming from the employment of 1 000 persons in the uranium mine. He is looking forward to the time when the repository will be effectively sited and the NyMTIT can seek contact with investors to complete the local development profile. The mayor considers that maintaining local participation in international programmes is important both to foster such contacts and to perpetuate the nuclear awareness and expertise of the local citizens. Local people will work in the future visitors' centre and act as ambassadors.

Finally, the mayor spoke of the sustainable relationships established between the settlements and other actors including the regulator HAEA and the Society of Civil Engineers. He expressed confidence that laws and licensing procedures would be correctly applied. Mentioning once again NyMTIT's new access to Parliament as a recognised lobby, Mayor Kovács highlighted the Hungarian municipalities' success in building their role in the decision-making process.

Roundtable discussions – Building a sustainable facility[7]

Tables 1-4 addressed the first two questions:

1. What do you need to do or to put into place now, in order to take care of the future residents? How many years or generations into the future can we foresee?
2. How do you build a relationship between a facility and regional life?

Tables 5-8 addressed the third question:

3. What kind of technical information is necessary for the local level to create a sustainable relationship with an implementer? How about a safety/risk assessment, a monitoring plan, an environmental protection plan, etc.? Can there be a direct relationship with the safety authority?

The moderator particularly noted the following conclusions. They are supported by sample citations from various round tables.

The need for *mutual trust* is essential to make progress. It was clear that the technical experts in PURAM had established that and were regarded as "human" (and humane?) people. Government and local politicians were also trusted but less than experts. The involvement of independent experts (e.g. Academy of Sciences) is helpful.

Round tables observed that experts and politicians were involved in providing credible information. Keys to this credibility and resulting trust included: the information was made accessible to all, was adapted to all layers of a population, and was delivered in an open and honest way.

An interesting story was told about a "local expert" who contributed to trust and confidence regarding the absence of health effects related to the presence of the near surface institutional waste repository in Püspökszilágy in the north of Hungary. This local veterinarian performed a study of a farm with a population of 5 000 pigs, located 4 km from the repository. The veterinarian concluded after ten years of observation that there was no animal health problem to be found, and informed the local council and citizens. Because this expert was known to be "no friend" of the repository, his empirical conclusions carried that much more weight.

Trust was found in particular in the relationships between the technical actors and local decision makers. Both sides were willing to communicate, in plain language. The implementer staff established long-term personal relationships with local decision makers and had a good track record in listening and responding. Staff empathised with local expectations for employment, housing improvement, social and tourism development. They were responsive to requests for tools and training that could result in a higher standard of living. The continuous dialogue established over time was an informal way of "greasing" decision making, which could not be matched by formal mechanisms. Citizens are aware of these relations and see them to be conducted in a transparent manner.

7. Reported by Steven Chandler, UK Environment Agency.

There has been criticism in the past that funds earmarked for "information" have been spent for local development initiatives. This situation has been clarified by the change in national law to permit such use. Elected people attending the workshop were particularly keen to display the transparency they try to assure in their own communities. They invited FSC delegates to visit their home towns and "see for themselves the honesty" with which affairs are conducted.

What the round tables learned about trust and co-operation among stakeholders helped them better understand the referendum concerning the Bátaapáti repository project. For Westerners, the fact that a very high proportion of local residents turned out to participate and returned a 90% "yes" vote seemed somewhat suspicious. Had there been pressures on the populace? A direct question about "what explains the landslide vote?" got the following response: "The honest and open practices, and up-to-date information provided to population constitute the first reasons. The financial grant foreseen for Bátaapáti was also part of this success. Finally, PURAM employees are living in the townships, giving a face and credibility to the company."

Local leadership and "ownership" of a repository project are very important. Civil organisations need to be fully engaged. The Information Associations were indeed very active in the Hungarian context.

Long term monitoring is essential to provide confidence. This information must be easily available to the community and, indeed, local people should be trained to do certain monitoring tasks.

It was interesting and noteworthy to learn that the Hungarian residents take their local monitoring role very seriously. They have called for essentially a monitoring partnership including the nuclear operator, the safety authority and the Information Associations. They want to inspect waste packages upon arrival at the place of storage, and have obtained training for this task.

Local cable television, which is very developed here, has allowed a camera to be trained directly upon a storage installation for 24-hour monitoring. In another area, results from the continuous monitoring of local background radiation are broadcast on the local TV.

Local development and tourism are a key part of a successful project. Local people wish to be actively involved in the project and improvement in living standards is expected.

The importance of *education and involvement of children and teachers* was emphasised. This is not just about information provision and classroom learning; they need to be actively involved in the project.

Communication must be active and imaginative. The round tables noted the need for a broad variety of communication formats to reach different sorts of people. The Information Associations have been successful in diversifying the offer. Early on, the associations played an interesting role in bringing together communities which had had little prior contact. Whereas settlements before were isolated, the Information Associations have succeeded in creating a true sub-region of villages whose leaders and citizens are co-operating, communicating and interacting. The associations fostered and animated deepening relations between schools, clubs and individuals. Following the Hungarian tradition, the diverse everyday club activities are seen to develop local life, culture, and connections.

The associations have also been prolific with different sorts of newsletters, fact sheets, visitors' centres exhibitions and educational activities (school competitions, a museum trail in a nature park). Information Association members have been able to make study trips abroad. Local cable television is much used, and the agenda and minutes of frequent meetings between PURAM and local officers

(including scientific meetings) are published online by town halls. Finally, the nuclear power plant employees are a natural source of information to their families and neighbours.

It must be clear that local people have *real influence* on the implementation of the project. Hungary has moved recently from a "militaristic" management approach in which local people had nothing to say, to a new multi-level co-operation in which local leaders can address themselves to any central authority and bring information directly to the citizens. The roundtables saw that the local elected people, in particular through the Information Associations, now have "steering power". This probably helps maintain high interest and involvement in the projects.

THEMATIC REPORTS

Co-operation and Competition in Regional Economic Development Associated with Radioactive Waste Management

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Competitive and co-operative behaviour

Competition and co-operation appear in many different social venues. Here, I will touch on a variety of examples of co-operative behaviour in: economics, politics, research, and everyday life activities such as sports. These four diverse examples are meant only to illustrate the variety of forms that co-operation takes, it is not meant to be an exhaustive list.

The economic market is one of the most obvious places associated with competitive behaviour. Firms compete with each other under a clear set of legal rules and customs for new markets and for market share. For example, Motorola and Nokia are two leading companies in the cellular telephone market. They compete aggressively for customers.

But the economic market is also a common place to find co-operation.[1] Although firms are locked in vibrant competition to produce innovations and to gain market share, they also depend upon a significant degree of co-operation. Consider the case of cell phone development. Early on in the product development cycle, Motorola and Nokia came together to co-operate on defining standards for the industry. Standards were necessary to make efficient use of the electromagnetic spectrum and to enable efficient capitalisation of communication towers. By establishing frequencies of operation and signal modulation standards, the companies assured critical gains in economies of scale. Because Motorola and Nokia phones each operate on similar signals, communication towers and equipment can be shared, which means that each company does not need to establish its own network of towers. Agreeing on frequencies leaves more segments of the electromagnetic spectrum available for other social purposes, preventing wasting this limited resource. Co-operative behaviour, in this example, produces efficiency gains for the corporations.[2]

In pluralist democracies, political parties compete for public support and political influence. Elections are the most direct forms of competition in politics. There are clear winners and losers in elections. However, because of the nature of politics, it is often difficult for one political party to gain enough power through elections to enable it to rule alone. Indeed, political systems are set up so that even minority parties can have influence over certain matters. For instance, some important decisions such as amending a constitution or impeaching an official, takes a super majority of parliamentarians. In these instances, or when one party has not won a decisive majority in the election, compromise occurs. *Compromise* refers to way in which a dispute is settled. A compromise represents a middle point, of sorts, between two competing demands. Thus, compromise is a result of indecisive competition. In the United Nations earlier this year, there was a dispute about which Latin American country should serve on the Security Council. Guatemala is strongly endorsed by the United States,

1. Thornberry, Jon B. (20020, "Competition and Co-operation: A Comparative Analysis of SEMATECH and the VLSI Research Project. Enterprise & Society", *The International Journal of Business History*, Vol. 3, No. 4, pp. 657-686.
2. Bengtsson, Maria. (2004), "Introduction: New perspectives on competition and co-operation", *Scandinavian Journal of Management*, Vol. 20, pp. 1-8.

while Venezuela has been proposed as an alternative. In 48 rounds of voting, neither country was able to gather enough votes to acquire the seat. To remedy this logjam, Panama was proposed as a compromise. It won soundly on the next round of voting. None of the competing parties had strong objections to Panama; however it also is neither side's first choice. This exemplifies the adage that all politics is the art of compromise.

Although politics is deeply marked by competition and the art of compromise, co-operation also comes to bear at times.[3] Co-operation becomes necessary when the full might of the country is required, as in times extreme circumstances. During these times political differences are forgotten and politicians describe themselves according to their national identity, not their political party identity. Political co-operation is grounded in a shared set of values. In times of war it is to preserve the integrity of the nation. In times of natural devastation, it is to preserve the life of the citizenry. Both these goals are so primary that they are widely seen to be above political competition.

Scientific research is an arena in which both competition and co-operation prosper. Science generates new knowledge based on the principle of multiple witnessing. This refers to the simple fact that observations, which are made into knowledge claims, need to be validated by more than one person before they are accepted as tentative truth. Experiments are rigorous protocols for making specific types of observations. In the model of positivist science, which is by far the most dominant model for science today, observers must be independent of each other and independent of the object of their observations. Thus each scientist functions independently. Competition comes into play in the attempt to invalidate hypotheses or to posit rival hypotheses. To put it simply, one scientist advances a hypothesis (relating two variables to each other) and other scientists attempt to either repeat the experiment and find the different results or to posit alternative explanations for the results. These can both be seen as competitive actions.[4]

As science becomes more technically complex and as science is promoted to solve more practical problems, it becomes necessary to assemble interdisciplinary teams of scientists to conduct research. These teams function by co-operating with each other on shared goals of a research project. But inasmuch as scientists from different disciplines have limited understandings of each other's expertise, this type of co-operation might better be described as coordination. *Collaboration* is the act of working in a coordinated manner on a collective project. This is becoming increasingly common as science becomes more advanced.

Team and individual sports are fascinating venues for the study of competition and co-operation. One definition of a team is "a group of people organised to function co-operatively as a group." It is interesting to note that, to maximise its competitiveness, a team must work co-operatively. Soccer is a perfect example. A soccer team peopled with athletes who do not pass, but attempt to take the ball downfield alone, will lose every game. Even small amounts of competition within the team can run the team's competitiveness. Competitiveness is enhanced when the team acts *as one*. And yet the purpose of this coordination is solely to compete. As such, one may think of the co-operation as a form of competition.

Individual sports appear to be purely competitive; however, even here co-operation sometimes appears. In her description of sled dog racing, Sharon Kemp pointed out how mushers sometimes switch from competitive to co-operative action.[5] It happens among mushers who have an ethic to the

3. Larsen, Jakob Bjerg, Karsten Vrangbaek, Janine M. Traulsen, (2006), "Advocacy Coalitions and Pharmacy Policy in Denmark-Solid Cores with Fuzzy Edges", *Social Science and Medicine*, Vol. 63, No. 1, pp. 212-224.
4. Georghiou, Luke (1998), "Global Co-operation in Research", *Research Policy*, Vol. 27, No. 6, pp. 611-626.
5. Kemp, Sharon F. (1999), "Sled Dog Racing: The Celebration of Co-operation in a Competitive Sport", *Ethnology*, Vol. 38, no. 1, pp. 81-95.

sport that places the health and safety of the mushers and the dogs ahead of the competitiveness. On a race that lasts many days and includes travelling at night in arctic wildernesses far from civilisation, mushers sometimes have to rely upon each other for their survival. Under these circumstances the competitors temporarily "set aside" the race and work together toward the shared goal of keeping each other or their dogs alive. Kemp laments the gradual dissolution of these values as more and more people enter the race with the sole goal of winning.

Conceptual insights to competition and co-operation

Must competition exemplify aggression, hostility, or enmity? Is co-operation necessarily about individuals surrendering their autonomy and merging into some unitary whole? Clearly both of these represent extremes. Neither is necessarily unrealistic or uncommon, but they are also not the only definitions of what competition or co-operation can be.

There does seem to be a place for what might be called "ruthless competition" in our endeavour to understand collective action. Even if we exclude cases of physical violence from consideration, there are clearly cases of hostile competition. The so-called "robber-barons" of the late 19th and early 20th Centuries in the United States – John Rockefeller, Andrew Carnegie, JP Morgan – were known for the fervour with which they engaged in competition. Darwinian ideas of "survival of the fittest" and competition lent further credibility to the notion that competition should be ruthless.

At the same time, clearly not all competition takes on these qualities. The goal of sport matches, for instance, is not to annihilate the other team, but to compete for fun in a manner that makes future matches desirable.[6] Each team wants to win, but more than that, each team wants to play again. Thus the goal of preserving the opportunity for competitive play supersedes the goal of winning. This is why sports develop a highly structured set of rules with referees to identify breaches of rules and to dish out penalties. We might label the competition we find in sport "friendly competition".

Friendly competition is not absent from the economic or political realms. Indeed, the notion that business seeks to destroy competition and create monopoly is seen as primitive today. Instead, the usefulness of competition to drive innovation and to promote efficiency is recognised. Progressive entrepreneurs value their competitors for keeping them sharp, at least as long as they don't put them out of business.[7] Governments pay a great deal of time promoting competition. For example, the European Competition Network is responsible for promoting competition inside the European Union. Its purpose is to counter economic behaviour that restricts competition across borders, which is described in Articles 81 and 82 of the European Treaty. While it promotes competition, the European Competitive Network itself is a co-operative institution, with staff of competition agencies from each member state co-operating to establish and enforce rules to encourage and defend competition.[8]

Friendly competition and ruthless competition mark out ends of a spectrum of competitive behaviour. Table 1 summarises this typology. The two forms of competition have very different ends. Ruthless competition is completely ends oriented, while friendly competition is more focused on the competitive process. Each mode leads one to perceive others and one's self differently as well. In ruthless competition others are enemies or opponents to be beaten. One sees oneself as a winner and losing is unthinkable. But with friendly competition the stakes of winning are not so high. One sees

6. Albert, Edward (1991), "Riding a Line: Competition and Co-operation in the Sport of Bicycle Racing", *Sociology of Sport Journal*, Vol. 8, No. 4, pp. 341-362.
7. Swedish competition authority (2006), "Anti-competitive co-operation. Prohibition against anti-competitive co-operation", *www.kkv.se/eng/competition/co_operation.shtm* accessed 9 October 2006.
8. European Competition Network from: http*://ec.europa.eu/comm/competition/antitrust/ecn/ecn_home.html*, accessed 9 October 2006

oneself as a fit competitor, someone who likes a tough game, and who is capable of losing. It is possible that we find ourselves acting each of these ways at certain times in our lives, but most of our competitive behaviour falls somewhere between these extremes.

Table 1. **Summary of two ideal extreme forms of competition**

	Ruthless Competition	Friendly Competition
Aim	Dominate market and acquire monopoly	Engage in vibrant competition. Sustain competitive conditions.
View of others	Enemy, Opponents	Colleagues
Self Identity	One who wins, who is victorious, who dominates others. Losing is unthinkable.	One who is playful, fit, who enjoys a good game, and yet can also withstand losing.
Metaphor	War Play for keeps	Game Play for the sake of playing
Example	Andrew Carnegie JP Morgan John Rockefeller	Professional Sports Leagues Competitiveness Initiatives

The temptation to envisage co-operation as wholesome, friendly and constructive is strong, but is this always the case? Co-operation is seen by many economists as having a distorting effect upon the economy.[9] Too much co-operation is inconsistent with the market functioning when it has the effect of restricting economic actors from acting independently of one another. Monopolies or cartels are undesirable outcomes of economic co-operation. For this reason, governments often enact legislation, rules, or guidelines to identify, discourage, or prevent inappropriate co-operation. Such definitions establish threshold levels, not attempting to ban all co-operation, but only to eliminate co-operation that has overly strong impacts on the market functionality. Still, economists also recognise the importance of co-operation as a positive economic action. Firms co-operate to develop highly complex products that neither firm alone could develop. They also co-operate to pool resources in order to reduce the costs associated with breaking into new markets. A good example of this took place in the 1990s when three Finnish home-building companies co-operated to develop marketing brochures for the German housing market that made the three companies appear as one larger company.[10] Such co-operation is temporary with competition remaining the default condition.

This type of co-operation might be best described as tacit co-operation (see Table 2). The conditions necessary for co-operation are tacitly present, that is, they exist without anyone intentionally manipulating or creating them. In this kind of co-operation each individual pursues their egoistic aims, it is just that these ends correspond in a manner that makes co-operative behaviour a logical way of realizing them. No one makes a sacrifice or compromise for the greater good. The Finnish companies in the example above each wanted access to the German market. They still designed and built their own products. They simply wanted to create an efficient way of accessing the German market. By developing a co-operative effort in which the companies presented their products equally in marketing materials and shared the costs of attending home shows in Germany, they lessened the costs of marketing and also benefited by making their companies look larger than they were. The relationship among the firms was co-operative, but on a very light level. There was no change in identity, no commitment to the other beyond the specific marketing functions. In fact, the

9. Green, Donald P. and Ian Shapiro (1994), "The nature of rational choice theory," in: Pathologies of Rational Choice Theory: A Critique of Applications in Political Science. Yale University Press, New Haven.
10. Tidström, Annika and Sara Åhman, (2006), "The Process of Ending Inter-organisational Co-operation", *Journal of Business & Industrial Marketing*, Vol. 21, No. 5, pp. 281-290.

default condition remained competition. And when the marketing efforts failed to generate the business they had hoped for, the companies quickly went back to competing with each other.

In tacit co-operation we find “single loop learning”. Single loop learning refers to learning about how to better accomplish specific tasks without questioning the dominant values or principles that structure the institution. This kind of learning improves performance without revolutionizing the institution. Thus, the confederation of co-operators will reflect on how to accomplish their task effectively, but they will not question deeper principles such as the relationship between individual and collective identity.

A second kind of co-operation (see Table 2) is incremental co-operation. Although the primary goals of the actors are still egoistic, this mode of co-operation is marked by the appearance of secondary goals that are collective. In this case egoistic goals do not need to be in alignment with each other. They only need to not be in competition. When this is the case, secondary collective goals can dominate and drive co-operative behaviour. The default state here is no longer competition, but rather coordination. *Coordination* refers to independent elements being harmonised toward a specific end. The difference between coordination and deep co-operation has primarily to do with the level of commitment and shared identity. An important quality of incremental interaction is learning that moves beyond single loop learning. If single loop learning is about how to accomplish tasks more effectively and double loop learning is about how to restructure the normative principles under which the behaviour takes place, then transitory learning is about beginning to make the connection between routines and norms. This is not double loop learning because the entire system of norms is not open to reconsideration, only the portion of the normative system that corresponds with the pre-existing consensus. Let’s take an example.

Table 2. **Summary of three ideal modes of co-operation**

Mode of Co-operation	Tacit Co-operation	Incremental Co-operation	Deep Co-operation
Pursued ends	Egoistic ends. They happen to overlap.	Egoistic and convenient collective ends.	Collective good is pursued.
Orientation Toward others	Strategy.	Sympathy. Empathy.	Unity.
Self Identity	Individual.	Revised individual.	Part of a larger whole.
Learning	Single Loop.	Transitory.	Double Loop.

Suppose there are two towns neighbouring each other. Frequently they compete for scarce resources, such as business investment, real estate development, educated residents, state investment in preserving open space, and so on. But they also have several reasons to justify co-operation. They might tacitly co-operate to build a school, for instance. In this case each town is acting on its selfish interests – to provide education to its residents and to keep costs down. For an example of incremental co-operation, we might imagine that the towns are on opposite sides of a river. Each town has a small economy, but would experience greater benefits by linking the two villages. A bridge would allow each town access to each other’s businesses. Thus, the towns have a shared interest in building a joint economy. However, the towns still enjoy benefits from maintaining their independence and they do not want to merge into a single municipality (this would be deep co-operation. Learning how to deepen their economic connections will require single loop learning (how to coordinate investment) but it will also require some revision of deeper values and identity. However, the changes and learning required do not fundamentally remake the identities of the two communities. Incremental co-operation is intermittent. Once the immediate goals are achieved, the parties can slip back to their natural state,

which is competition or coordination, although it will not take exactly the same form. In incremental co-operation, the identity changes that have occurred are not readily reversible.

Deep co-operation represents the third type of co-operative behaviour. In deep co-operation egoistic goals are set aside and a collective goal is pursued. Such collectivism cannot be simply an intersection of commonalities among individuals, but must express a joint meaning of identity. Thus people no longer ask, "What is good for me?" instead they ask, "What is good for us?"[11] In this transformation, the individual goals are replaced by collective goals. Deep co-operation can be extremely rewarding and productive, but it has two sides. The positive side is apparent when we find individuals coming together to serve a dignified common purpose. Take the example of people from different communities coming together and co-operate to develop a habitat management plan for an endangered species that lives in the region. In this case, each community has to bear unequal costs and receive unequal rewards, thus their co-operation cannot be explained as purely egoistic behaviour. Instead, they identify with a common purpose – a common identity of communities living in harmony with nature – and it is this vision that inspires their collective action.

Although the brighter side of deep co-operation is frequently apparent, there is a darker side as well. The root of the danger lies in the strength of the bond of solidarity among the members. If this bond is too strong, too permanent not only can the co-operation be used for undignified reasons, but also can have destructive effects on people's individualities. For examples of undignified applications we can turn to any behaviour damaging or deadly to people. Crime, war, sabotage, or terrorism of the kind we find in any war zone can be consequences of deep co-operation. For examples of where co-operation is damaging to individual identities, we can look to cults or fervent religious fundamentalism. Think of the cults which have ended in mass suicides. These are examples where individuals surrendered their autonomy to a leader and the leader asked for the "supreme sacrifice".

Clearly these examples represent situations that are extreme and unusual. Most co-operative behaviour takes place in the context of a rational, free, democratic society in which individuals are not expected or willing to give up significant portions of their identities. They are expected to revise their sense of self to be more based around a collective sense of being, but this does not entail eliminating individuality. Still the question of whether to co-operate or compete needs to be asked with an open mind. Both co-operative and competitive behaviour are reasonable and dignified forms of behaviour. Finding the right manifestation for any given situation is the challenge we all face.

As with so many other things in life, the key is to the question of co-operation or competition is balance. Co-operation and competition are dialectical opposites. They create and maintain and define each other. They each are incomplete without the other. There is a direct parallel to Jane Mansbridge's notions of adversary and consensual democracy.[12] In her study of local community-based democracy in the United States, she found two forms of democracy prevalent. In adversary democracy people debated, argued, and resolved conflicts by voting. In consensual democracy, people deliberated, shared, and resolved conflicts through learning and redefinition of goals and strategies. She discovered that both these strategies were important and each had its right place in civil society. The challenge, she noted, is to figure out how to transition back and forth between the two.

The question of whether to co-operate or whether to compete must be revisited. Perhaps the better question to ask is: "How can we learn to move between co-operative or competitive behaviours in a manner that is healthy, respectful, and productive?" Transitions are always challenging, especially when they require very different forms of identity or social organisation. Moving from consensual to

11. Habermas, Jürgen (1981), *Theory of Communicative Action*, Vol.1, Beacon Press, Boston.
12. Mansbridge, Jane (1980), *Beyond Adversary Democracy*, University of Chicago Press, Chicago.

adversary democracy demands people set aside the goal of building a collective identity and “agree to disagree”. The psychological costs of this can be significant.

People desire consistency with regard to moral rules. They find it awkward to move among forms of organisation where the rules are stood on their head. Moving from competition to co-operation or vice versa requires changing the rules. When corporations, organisations, or governments ask people to shift back and forth among two very different forms of social arrangement, they risk losing legitimacy and creating apathy. Transitioning among forms of social arrangement appears to be necessary, but it also seems to be a very difficult thing to learn. Such learning needs to be supported by institutions that promote these changes. Making the reasons clear would help, as would clarifying the qualities of behaviour that are desired in each instance.

Learning to see the positive features of both competitive behaviour and co-operative behaviour leaves us open to the possibility of using each type as a resource or a strategy for solving shared and finding ways of living that are dignified and sustainable.

Local Voice and Benefit in the Implementation of RWM Policy

Andrew Blowers
Open University and Committee on Radioactive Waste Management (CoRWM), United Kingdom

The Contemporary Context of Decision Making

In the past few years in several countries key decisions have been taken on the options for the long-term management of radioactive waste and most have opted for deep geological disposal as the best available approach. In a few cases, Finland, Sweden, the United States, France, progress has been made towards the selection of a site for a repository. As the emphasis shifts from the assessment of options to the implementation of proposals so there is a corresponding shift from generic to specific concerns and from national policy to specific and local siting issues. Questions of local voice and benefit, of involvement in decision making and the well being of communities come more and more to command the attention of policy makers. In setting out strategies for implementation it is necessary to take into account the contextualising elements which influence the framing and development of policy. There are three elements in particular which may be discerned. They are: timescale; discourse; and community.

Taking the first of these, *timescale*, it is axiomatic that implementation takes place over a long period and that policies must have enduring characteristics. There is a distinction to be made between geoscientific timescales which capture the very long period over which risk from radioactivity persists. Then there are the much shorter socio-cultural timescales which reflect the period of human perception and concern, usually no more than, at most, a hundred years or so. Geoscientific timescales emphasise the need for long-term safety and, therefore, the stability and integrity of engineered and natural barriers surrounding wastes in a repository. Socio-cultural time is more concerned with the health and safety of present and near future generations and, consequently, concern here is with retrievability and the sustainability of institutional controls. These contrasting timescales imply different ethical concerns and priorities which are discussed below.

Changing *discourses* presents a second contextual element. We are moving from a discourse of conflict to one of consensus. The discourse of conflict which was especially prevalent from the end of the 1970s until the mid-1990s was characterised by a domination of expertise of science and technology, by centralised and secretive decision making in which proposals were announced and then defended (the classic Decide-Announce-Defend approach). This approach aroused conflict the moment sites were identified arousing the opposition of local communities able to mobilise to defend their interests and integrity against an alien and unwanted intrusion. Almost every country has examples of such conflicts in which the government and nuclear industry were defeated in their efforts to achieve a location for radioactive waste facilities. In Hungary, the opposition to Ofalu provides a text book example of the process of conflict and defeat (Ormai, 2006) as a technocratic approach foundered in the face of a community able to assert its social integrity and political influence. Here, as elsewhere, a new discourse began to emerge reflecting the social context of the problem of radioactive waste. This was a discourse in which openness, consensus and participation in which there was strong local voice became the foundation of a new approach. It was in this context that more successful siting strategies such as that resulting in the selection of Bátaapáti were inaugurated.

Community is the third element of context. With the change in discourse came the focus on engagement, partnership and a volunteer approach to implementation. It became recognised that local

benefit must be an integral element if communities were going to be willing to participate in a siting process. The notion of benefit intended to enhance opportunity is distinguished from the idea of compensation for risk or harm imposed on a community. Partnership working between the radioactive waste company and the local communities backed by packages of benefits is emerging, in many countries, as the basis of an open and trusting relationship. In Hungary an open and trusting relationship has been developed and economic and social benefits in the form of roads, jobs, schools have benefited the local community of Bátaapáti. There is emphasis both on community consent and on the need for democratic ratification of key decisions at the local level. The precise democratic context varies from country to country but it is generally acknowledged that consent by the community, endorsed through its political institutions, is fundamental to legitimising implementation at the local level.

Key Issues

Each of these three contextualising elements poses issues for the continuing implementation of policies and programmes of radioactive waste management. The key issues are: fairness; power; and well being.

Fairness. The issue of fairness arises from the concern with timescales referred to earlier. This problem has two dimensions. One is fairness over time, the concept of intergenerational equity. The questions of concern here are, How far into the future can/should we be concerned? Should we be more concerned with the near future than the far future? And these questions raise practical problems for local communities. Some of the possible solutions have been identified by Erik Van Hove in a discussion paper presented to the FSC in Hungary (see Session 6 *infra*). There is the issue of whether and how the presence of a repository could be marked as a warning for future generations? What provision should be made for retrieval and monitoring? What kind of local benefits should be passed on in terms of cultural, physical presence or a return to the natural greenfield environment? In formulating strategies, consideration of timescales will help to identify what is possible and practicable both now and in the future.

A second dimension is fairness between places – the concept of intergenerational equity. Many, if not most, nuclear communities are located in small, remote, under-developed places. They may be said to be “peripheral” communities (Blowers and Leroy, 1994). They share certain characteristics. They tend to be economically marginal and monocultural, heavily dependent on the nuclear industry for wealth and jobs. They are politically relatively powerless with key decisions affecting their welfare taken elsewhere. As a consequence they tend to present a defensive, ambivalent sense of identity and community. This results from the concerns about stigma which are attached to the risk of contamination and danger associated with the nuclear industry. Given these characteristics the issue has been how to avoid imposing burdens on these vulnerable communities. On the other hand, and paradoxically, in the new dispensation where the emphasis is on enhanced well being for communities it may become an issue of how to ensure that the benefits provided do not privilege those communities which are willing to accept nuclear waste facilities. This leads to the second set of issues concerned with power.

Power. The shift in discourse discussed earlier was largely prompted and confirmed through the conflicts over siting of facilities during the 1980s and 90s. It became clear that communities were able to resist proposals imposed from above. Nuclear communities, hitherto peripheral and under-privileged, were able more and more to exert leverage. Radioactive waste became a social problem requiring a local solution; hence communities contributing to relieving society of a problem would require that society to provide something in return. There is a growing awareness, confidence and capacity in communities participating in radioactive waste management.

There remain questions of who holds effective power. Does it reside in the nuclear waste companies which have control of resources? What constitutes the local voice? The situation obviously varies from country to country. At one end the relationship is still rather elitist with the state and the industry holding the power but, increasingly, recognising the role of communities in scrutinising decisions and representing local interests. In many countries today, and Hungary is one, local communities do have an influential voice and participate in decision making affecting their welfare. But the model remains one of decisions taken by the management company in response to representation from the community voiced by its political representatives. In a few countries, notably Sweden, Finland, Belgium and prospectively the United Kingdom (CoRWM, 2006) the relationship between company and community has become altogether more open and equal. There is a strong democratic framework based on a willingness to participate and, in certain instances, a right to withdraw from a siting process. There is citizen and stakeholder dialogue, implementation through partnership arrangements and a staged decision making process. The trend appears to be very firmly in favour of increasing the local voice in the implementation process thereby realising greater benefit and opportunity for local communities which leads on to the third set of issues.

Well-being. A key issue here is whether and, if so, how can the negative image associated with radioactive waste be transformed to provide the kind of positive, progressive, even iconic status for a nuclear community envisaged in the discussion paper by Professor Van Hove (see Session 6, these proceedings). As the paper states: Communities do not gain added value and sustainability purely through financial compensation and development opportunities. Whilst those economic means are important, RWM projects also offer opportunities to improve well-being, consolidate knowledge, fulfil value ideals, elaborate community identity and image, and live out desired social relationships (p. 7). This is not a matter of economics alone although adequate resources and regional economic development strategies (as proposed, for example, in the AkEnd report in Germany (2002) and in the context of the French underground research laboratory at Bure).

Well-being implies a holistic and sustainable approach to community development. In the words of the UK Committee on Radioactive Waste Management (CoRWM) "well-being" means "those aspects of living which contribute to the community's sense of identity, development and positive self-image" (2006a, p. 10). This is a broad conception pertaining to increased control over community affairs, a vision for the future involving improvements in the quality of life and making the community a better place in which to live. The question remains whether it is realistic to make the transformation from places of stigma to places of pride with the multi-functional features of integration, accessibility and amenity envisaged in the discussion paper by Van Hove. There is a somewhat disingenuous hyperbole in the idea that such places may one day become of "outstanding universal significance", representing a "unique achievement" (p. 17). Nonetheless, the idea that communities harbouring nuclear waste should achieve prosperity, pride and positive self-image is no longer a fantasy but a concept actively being pursued in a number of places. Eventually, it may be that such communities, initially supported through benefits packages, will become self-sustaining. That point is, however, some way off.

Problems and Prospects

Although there is manifestly a new approach to radioactive waste management, in most countries we are only at the beginning of the process of implementation. The politics and practicalities of introducing innovative approaches designed to transform perceptions and practices poses some difficult problems. These can be identified by asking the questions, Where? How? When? and Who?

Where will the facilities be? Up until now the new approaches outlined in this paper have been introduced in a few small countries. Sweden and Finland have been pioneers of engagement with

communities and have achieved relationships of trust and confidence between the waste management organisations and the local communities. In consequence, Finland has identified a site for deep disposal of its spent fuel close to one of its operating nuclear power plant sites at Olkiluoto and Sweden is currently evaluating two candidate sites at Osthammer and Oskarshamn locations close to existing nuclear waste and spent fuel management facilities. In both countries there is relatively high trust in the state and its institutions, the waste stream (spent fuel) is relatively straightforward and the communities involved perceive clear benefits in consolidating the respective roles they already play in waste management. In Belgium, considerable progress has been made towards the development of a repository for low level wastes with the establishments of partnerships and the selection of Dessel as the location for the facility. Hungary, too, has made progress with its site for low and intermediate level wastes at Bátaapáti, an area some distance from the country's single power plant at Paks. Although the original site selection process was initiated by the waste management company, the local community was eventually drawn into the process and the relationship between community and waste management body that subsequently developed reflects the new approaches.

Among the larger nuclear countries, France, following a long period of conflict, has focused on a single site at Bure though the local voice is largely present through representative governmental institutions rather than community engagement. The United States also has identified a single site at Yucca Mountain but it would be true to say the situation remains adversarial (between state and federal government) with an absence of any engagement in what is a largely unpopulated area. It is worth noting that in both France and the USA, the repository site is in what may be called a "greenfield" location, places that are thought to be technically suitable but hitherto unconnected with the nuclear industry (though Yucca Mountain is near the former Nevada weapons testing site). Both Germany and the United Kingdom have undertaken major reviews of policy and reached conclusions which are wholly supportive of the voluntary, co-operative and democratic ethos of the new approach (CoRWM 2006a and b, AkEnd 2002). But, in these countries the approach is, at present, generic and it is acknowledged that moving to the identification and development of a site for a repository will take a considerable time, possibly one or even two generations, before a repository becomes fully operational.

How will successful implementation be achieved? Under the new regimes of implementation a variety of methods are being used to secure the willingness of communities to become involved. They may be summed up in the key words of the title of this paper – "local voice" and "benefit". In terms of the former, communities expect a greater say in decision making, a real influence over their development and future. This can be achieved through a negotiating relationship with the waste management body which, as in the case of Belgium, could be formalised in a fully fledged partnership arrangement. Processes of community engagement using deliberative forums and ensuring openness and transparency will be important means of ensuring awareness, understanding and participation of stakeholders and citizens. And, it will be necessary to ensure that the local voice can be made effective through the democratic process and, if necessary, a veto or acknowledgement of a right to withdraw in certain circumstances.

As to benefits, the nature and variety of the possibilities is covered in the discussion paper. A useful division is that used by CoRWM into those benefits necessary to enable communities to effectively engage in the process (called "Involvement Packages") and those that are necessary to support both the short and long-term well-being of communities ("Community Packages"). The former include resources to provide information, knowledge and involvement in decision making while Community Packages contain the wide array of measures that support economic, social and cultural well-being. There is provision of infrastructure (as in the case of a new road and school at Bátaapáti), of community facilities, cultural assets and resources for economic development. Ultimately, the idea is to enable the community to achieve its particular vision or self-realisation. These provisions are not to be seen as incentives or bribes or compensation but, rather, as means for

the positive fulfilment of a community's potential. In the new approach successful implementation can only be achieved if it is seen to be beneficial.

When will it be achieved? One of the lessons learned from past experience of failed proposals is that any process of implementation cannot be rushed. The new approach suggests that adequate time must be provided to enable all those involved in or affected by decisions to participate if they so wish. Moreover, to succeed, the process must be open and accessible with provision for dialogue and deliberation with stakeholders and citizens. But, it is also important to avoid procrastination. Therefore, it should be a staged process, consolidated as it proceeds, and one reflecting the commitment of all parties and which is not a hurried attempt to reach a predetermined conclusion. The timelines of decision making vary from country to country. For instance, France hopes to commission a repository in 2025 (ANDRA, 2006), the United Kingdom which has yet to establish a site reckons it may be 2045 before a repository is constructed (CoRWM, 2006b, Annex 5). In every case the siting process is likely to extend decision making into the next generation. This will provide opportunity for those in the future to participate in decisions that may affect them. Decision making is seen as an ongoing process subject to review and, if necessary, change as it proceeds. This feature of what has been called the "continuing present" (Kommentus, 2001) does not absolve the present for assuming responsibility for ensuring that resources are available and decisions taken to mitigate burdens on the future. But it does provide flexibility for decisions about such issues as long term interim storage, retrievability, emplacement, repository closure to be considered as part of an ongoing and staged process of decision making. This question of responsibility leads to the final question.

Who will take responsibility? This question asks, responsibility for what and to whom? Clearly a responsibility for safety, security and environmental sustainability is laid upon the waste disposal body overseen by the regulatory process. These bodies are accountable to government and, with the elevation of the local voice in decision making, there will be some accountability to locally elected government. In most countries local government exercises responsibility in its role as the appropriate democratic basis for the representation of local interests in radioactive waste management within a national framework of policy making. This responsibility has become a crucial element in the legitimising of decisions at the local level. National government, in exercising its responsibility for the development and implementation of policy as a whole, sets the framework and identifies the key decisions that must be taken. While decisions are not irrevocable it must be recognised that the process extends beyond normal parliamentary lifetimes and requires commitment to the process on the part of all parties.

Beyond this there is a wider responsibility on the part of the society as a whole to those communities which host facilities and it is a responsibility that extends down the generations. The question of responsibility raises ethical issues (CoRWM, 2007). Some would argue that "responsibility has to extend to the reach of the impact of our actions and there can be no arbitrary cut-off point (CoRWM, 2006a, p.46)." A more pragmatic ethics holds that "we should exercise what responsibility we can whilst recognising our capacity to do so necessarily will diminish over time (*Ibid)*." Whatever view is taken local voice and benefits will be important components of a successful and sustainable strategy of radioactive waste management.

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Sustainable Radioactive Waste Management: Reflections on Building a Durable Relationship Between a Facility and the Local Community by Adding Value to Waste Management Projects

Erik Van Hove

The case for the added value approach

The Vandellos I Nuclear Power was built between 1967 and 1972 and was operated, without any significant problems, until 1989, when it was shut down due to a fire in the turbines. With the help of the former plant operator, Enresa, the Spanish nuclear waste management agency, undertook the dismantling of the plant between February 1998 and June 2003. That way a plant was lost that provided highly skilled and stable employment in the area for over thirty years. The plant also contributed in many other ways to the welfare and social life of the surrounding communities.

On a recent visit the mayor of one of these communities, Hospitalet del Infant, proudly showed the participants of a previous FSC meeting one of the initiatives to alleviate the resulting high unemployment rate of the town. In a hall build with European Union support an assembly line was set up for televisions with Korean parts. By doing so, German entrepreneurs made clever use of European trade regulations that put a limit on fully assembled units that could be imported in the European Union. A large number of local women found employment there, much needed to bring in some cash but perhaps also useful to escape their grumbling husbands no longer employed by the power plant.

For the sake of clarity we would like to contrast these two modes of operation to the point of caricature.

Such an assembly line is an exponent of the *global economy*. A plant has to be somewhere, but the localisation cost should be as minimal as possible, with overnight flexibility, the lightest footprint possible and the least possible time-space friction disturbing the market. A free flow of goods, labour and services allows to maximise profit, the sole mission of such a plant.

A power plant establishes a distinct presence in its area. Once it has taken its place in the landscape it becomes difficult to ignore, for good or bad. It establishes roots as deep as possible; it belongs to the *local economy*. Its demise is experienced as a loss, not only of employment, but also of a way of life. The plant took part in several aspects of community life: the festivals, the cultural organisations, and the welfare work. The plant contributes to local happiness.

The appropriate model for radioactive waste management projects is clearly the second one: insertion in the *local economy*. RWM initiatives need a committed and knowledgeable host community over a very long period. This can only be achieved if RWM projects are firmly localised and tied in with the daily life of the host community: RWM projects should go local and bring value to the community in multiple ways. As global economy rules very much dominate the present thinking and norm setting, a durable RWM initiative does not come about spontaneously, explicit value adding measures are required.

The ways to add value

The FSC presents at this meeting a report on ways to add value and achieve sustainability trough radioactive waste management facilities.[20] This report relates the experience of a large number of agencies and individuals from most countries engaged in FSC initiatives. We give a highly subjective summary.

Attention to design

Too often RWM facilities cultivate ugliness as a sign of responsible management and thrift. Dare to go outside the circle of utilitarian engineering and bring in some creativity and imagination. A project should fit in the landscape, have interesting features to explore and be accessible. That way more people will integrate it in their daily life and care for it.

Go for multi-functionality

The more connection modes a project has to the daily life of locals (a chance to earn a living, an opportunity for learning, a sports facility…), the more chances there are for a project to be cared for. A visitor centre can be so much more than a PR exercise. A thoughtful landscaping of surface areas can make them useable for recreation and sports facilities. Integration in daily life provides more long-term security than fenced in wastelands guarded by military style antagonistic forces achieve.

Distinctiveness

If a project achieves a distinctive presence, through remarkable architecture or beautiful landscaping or unusual features in the engineering, chances are that it will become an object of local pride. More people will take it up as something worthwhile; make it an object of civic pride, a part of local life.

Give meaning

If by hosting a project a community renders a meaningful service to society and is recognised as such, a project will more easily achieve acceptance.

The preconditions

Sustainable integration of projects in the local community is not only a matter of endowing projects with certain characteristics but also requires integrative methodology when setting up projects. The present climate of heightened security also presents a danger to durable, well integrated projects.

Develop projects in local partnerships

If projects are developed in close co-operation with local stakeholders, local aspirations will be integrated more easily and agencies have the opportunity to earn trust. Agencies are compelled to become more transparent and careful. Local communities acquire sufficient knowledge to share ownership. An open and trustworthy agency and a knowledgeable and empowered local community are the major success factors when getting started with a RWM project.

Avoid the trap of safety-through-adversarial-security

We live a time of vicious violence and counter-violence. It is very easy to be caught in this vicious circle and to instate all kinds of adversarial security measures to demonstrate the willingness to go for maximal safety. These adversarial systems create and sustain distance between a site and its host community, install a climate of suspicion and fear. All such security systems deteriorate over time. True safety is achieved through integration in the local community and the assurance of informed memory.

20. NEA (2007), *Fostering a Durable Relationship Between a Waste Management Facility and its Host Community: Value Added Through Design and Process*, OECD, Paris.

Appendix 1

PARTICIPANTS LIST

Budapest, Hungary
13-17 November 2006

	Belgium
Ms. Evelyn HOOFT	Press Officer, ONDRAF/NIRAS
Mr. Erik VAN HOVE	Professor (Retired), University of Antwerp
Ms. Annelies VAN STEENBERGE	Sociologist, University of Antwerp
	Canada
Ms. Marcia BLANCHETTE	Advisor, Radioactive Waste, Natural Resources Canada
	Czech Republic
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Mr. Tue DYEKJÆR-HANSEN	Civil Engineer, Statens Institut for Strålehygiejne/National Institute for Radiation Hygiene
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Mr. Timo SEPPÄLÄ	Senior Manager of Communications, Posiva Oy
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M. GREGORY DEGENNE	Head of Communications (Centre de la Manche), ANDRA
M. Michel GOUSSELIN	Mayor of Acqueville, Acqueville
M. Jacques HAMELIN	Mayor of Digulleville, Digulleville
M. Gerald OUZOUNIAN	International Affairs, Andra
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Ada ÁMON	Director, Energy Club
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Balázs KOVÀTS	Senior Engineer, Nuclear Power Plant Paks
Szilárd KRACHUN	Mayor of Bátaapáti, Social Association for Control and Information
Miklós MISZLER	Managing Director, South-Transdanubian Regional Development Agency
Peter ORMAI	Chief Engineer, PURAM
József RÓNAKY	Head of Authority, Hungarian Atomic Energy Athority
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LÁSZLÓ TISTYÁN	Director, Fact Institute of Applied Social Science Research
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Ferenc WEKLER	President, Region of Bátaapáti Regional Development Agency
	Japan
Shigefumi INATSUGU	Manager, Science and Technology Dept., Nuclear Waste Management Organisation of Japan
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	Spain
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Virpi SJÖBERG LINDFORS	Coordinator, Municipality of Osthammer
Anders SVALIN	Regional Coordinator for Final Repository, Regional Council, Kalmar County
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OECD Nuclear Energy Agency

Claire MAYS	Stakeholder Specialist, Radiation Protection and Waste Management Division
Claudio PESCATORE	Principal Administrator for Radioactive Waste Management
Takanori TANAKA	Deputy Director, Safety and Regulation

Appendix 2

DETAILED PROGRAMME

Tuesday 14 November 2006

Welcome by hosts
József Hegyháti, *Managing Director of PURAM*
István Gáncs, *Mayor of Tengelic*

Morning Session The History of RWM in Hungary and the Hungarian Institutional Scene
Chair: Gábor Buday, Director of Science and Technology, PURAM
Radioactive waste management in Hungary: policy, actors, projects
József Rónaky, Hungarian Atomic Energy Authority

Legal regulations and institutional framework for providing incentives to communities
Balázs Molnár & Ildikó Czoch, Hungarian Atomic Energy Authority

The changed and changing decision-making culture in Hungary with emphasis on environmental decision making
Richárd Szántó, Budapest Corvinus University

Sociological aspects of the Hungarian nuclear waste management programmes
Anna Vári, HAS Institute of Sociology

The value and lessons learnt from networking amongst Hungarian Public Associations and with outside experts
Győző Kovács, Mayor of Boda

Visit to Bátaapáti. Visit of the site of the planned L/ILW facility and meeting the municipality leaders

Wednesday 15 November 2006

Session 1 Opening of the Workshop[1]
Welcome Addresses by
Janet Kotra, Vice-Chair of the FSC
Takanori Tanaka, Deputy Director of the NEA
Mariano Molina, host of the preceding FSC workshop

1. To facilitate discussions a glossary of terms (compensation, incentives, benefits, bribes, spin-offs, added-value) will be given in writing by the NEA.

Report on previous day's community visit
by *Elizabeth Atherton*

Session 2 **Implementing the Development Plan in Step with Facility Development**
Chair and Moderator: *Anni Bölenius*

Presentations

- Legality and legitimacy of RWM policies – *László Tistyán, Fact Institute of Applied Social Science Research, Pécs*
- Local, regional and national interests – *Ada Ámon, Energia Klub*
- National and local interests as seen by the local administrator – *György Edelmann, Mayor of Kisnémedi*
- Views of the local and national public on RWM issues –*_oltán Ferencz, HAS Institute of Sociology*

Roundtable discussion based on the questions below

- Can a local/regional development plan be successful without an approved national policy for RWM?
- How do local people feel about solving a national "problem"? Is it fair?
- How does one assure the long-term stability of development mechanisms? How can one assure that promises will be kept? How much flexibility should be kept in the development plan?

Session 3 **A Facility as the Trigger of a Local/Regional Development Plan and a Region?**
Chair and Moderator: *Evelyn Hooft*

Presentations

- Looking back on how public associations were set up and affected regions defined
  Balázs Kováts, Paks NPP
- Local communities' interests and ways to achieve their goals
  Gábor Buday, PURAM
- Regional development initiatives
  1. *Balázs Kováts, Paks NPP*
  2. *Ferenc Wekler, politician*
- Development plans and conditions for joining
  Miklós Miszler, South-Transdanubian Regional Development Agency

Roundtable discussion based on the questions below

- What are the opportunities that a RWM project could offer to the region? Are they only economic opportunities?
- How to enable local communities to identify their interests and achieve their goals?
- What conditions or support are most important for a local community at the time of joining a waste management programme?

Thursday 16 November 2006

Session 4 **Building a Sustainable Facility**
Chair and Moderator: *Steven Chandler*

Presentations

- Could a repository be attractive to the community for the long run?
  György Edelmann, Mayor of Kisnémedi

- Basic expectations for local people for community monitoring and oversight
  Szilárd Krachun, Mayor of Bátaapáti
- How to build an attractive installation and neighbourhood?
  Attila Szabó, PURAM
- Information necessary for the local level to create a sustainable relationship with an implementer and a regulator
  Győző Kovács, Mayor of Boda

Roundtable discussion based on the questions below

- What do you need to do or to put into place now, in order to take care of the future residents? How many years or generations into the future can we foresee?
- How do you build a relationship between a facility and regional life?
- What kind of technical information is necessary for the local level to create a sustainable relationship with an implementer? How about a safety/risk assessment, a monitoring plan, an environmental protection plan, etc.? Can there be a direct relationship with the safety authority?

Session 5 **Thematic Reports**
Chair: *Péter Ormai*

Feedback by Thematic Rapporteurs

- Co-operation and competition in regional economic development associated with RWM
  Thomas Webler
- Local voice and benefit in the implementation of RWM facilities
  Andrew Blowers

Discussion

Session 6 **FSC Study on Building a Sustainable Relationship through Added Cultural and Amenity Value**[2]
Final presentation and stakeholder discussion
Chair: *Janet Kotra*
Moderator: *Steven Chandler*

- Forming a sustainable relationship between communities and waste management facilities
  Erik van Hove

The "Value Added Project" of the FSC highlights design considerations—functional, cultural and physical – that may help RWM facilities and sites fit into their community in a welcome and sustainable manner.

The presentation is followed by a moderated discussion. Stakeholders in attendance, in particular those who do not usually participate in the FSC, are invited to take the floor to tell about their own views and experience.

Discussion might address the questions such as:

- Will it be possible to achieve a multifunctional RWM facility (one that not only stores radioactive waste, but also serves the community in other ways)?
- What will make a facility aesthetically attractive?
- What will make it more understandable?
- What cultural values should be memorialised by the RWM facility?

2. The "Value Added Report" NEA/RWM/FSC(2006)3/PROV3 was provided in electronic form to all participants before the workshop.

The study also considers the benefits that may be gained from the very process of planning RWM projects that target sustainability and quality of life. These benefits – capacity building, local image refinement – should be understood as cultural *added value* in and of themselves.

Workshop participants may wish to discuss:

- How can community stakeholders contribute to planning RWM facilities?
- Which benefits been drawn in communities where a range of stakeholders have participated in planning?

Workshop Closing remarks
by Hungarian Hosts and NEA

Appendix 3

RADIOACTIVE WASTE MANAGEMENT IN HUNGARY:
POLICY, ACTORS, PROJECTS
HISTORICAL OVERVIEW

By Dr. József Rónaky
Hungarian Atomic Energy Authority

Act on Atomic Energy

- Fundamental law: Act CXVI of 1996 on atomic energy
- Principles (among others)
  - Safety has priority over all other aspects.
  - Safety disposal of RW and SF in accordance with the most recent but certified scientific results, no burden passed on to future generations.
  - Storage/disposal is safe if:
    - Protection of humans and environment is ensured.
    - Not higher impact beyond the borders than that is accepted in the country.
- Fundamental scientific, technical and knowledge and other information (including risks) shall be educated and disseminated to the public.
- Safety radioactive waste management is of national interest, therefore an appropriate organisation shall be established: PURAM in 1998.
- Financial resource: Central Nuclear Financial Fund (CNFF), detailed regulations in governmental and ministerial decrees.

Central Nuclear Financial Fund

- CNFF: a segregated state fund for storage/disposal of SF, final disposal of RW, decommissioning of nuclear facilities, financial assistance of local municipalities and their associations.
- The supervising minister of HAEA disposes of the Fund, supported by the Special Committee of CNFF (a body of delegates from various ministries and organisations)
- CNFF is managed by the HAEA.

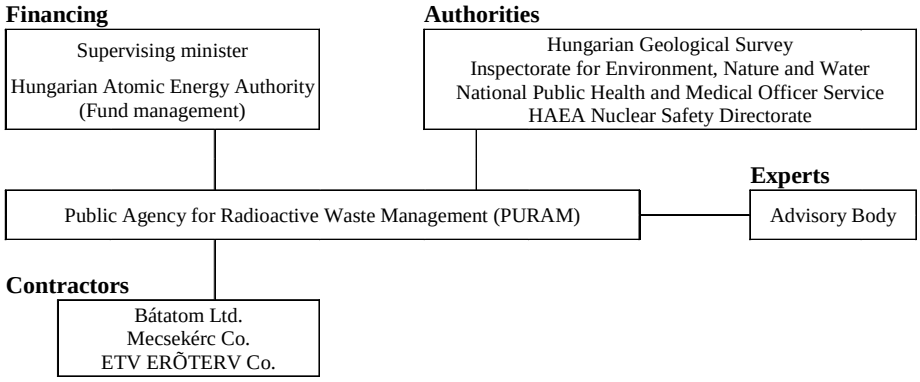
Strategic planning (1/2)

- PURAM prepares and updates *a medium and long-term plan* annually.
- Reviewed by the Special Committee of CNFF, approved by the supervising minister of HAEA.
- Detailed technical and economical investigation of present and future tasks lasting up to the end of decommissioning.

Strategic planning (2/2)

- Strategic tasks:
  - LILW from non-NPP producers: existing near surface repository.
  - LILW from NPP operation and decommissioning: new subsurface repository in the near future.
  - HLW and long-lived LILW from NPP and from non-NPP: preliminary activities aiming at a new deep geological repository.
  - SF from NPP:
    - Interim storage for 50 years in an existing facility.
    - Final disposal pending on decision on the back-end of the fuel cycle (now direct disposal is taken in cost estimates).
- Payment of NPP and the budget proposed for next year is determined on the basis of the medium- and long-term plan.
- Payments will the end of the NPP lifetime shall fully cover all costs arising in the future.
- After approval of budget by the Parliament, PURAM prepares *an annual work schedule* at the beginning of each year.

Organisational charts: actors



Hungary: Location of nuclear and/or RWM facilities, projects or investigation activities

Legend:

Budapest	Budapest Research Reactor Training Reactor at the Budapest University
Püspökszilágy:	Radioactive Waste Treatment and Disposal Facility, from 1976
Paks:	Nuclear power plant Interim spent fuel storage
Bátaapáti:	Site for LLW/ILW repository (under construction)
Mecsek Hill:	Area investigated for HLW repository. (*The West Mecsek Public Information Association is chaired by the mayor of the town of Boda, shown)*

Table 3. **Information and control associations and their connection to a radioactive waste management facility, construction or investigation site; financial assistance provided to each association in 2005 and 2006**

"Social Association for Control and Information" (TEIT) – 13 member settlements	"Isotope Information Association" (IIT) – 7 member settlements	"Social Oversight Association" (TETT) – 6 member settlements	"West Mecsek Public Information Association" (NyMTIT) – 9 member settlements
Interim Spent Fuel Storage Facility (Paks)	Radioactive Waste Treatment and Disposal Facility (Püspökszilágy)	LILW Repository under construction (Bátaapáti)	HLW URL site selection (Mecsek Hill)
270/240 M HUF (1.1/0.9 M Euro)	125/210 M HUF (0.5/0.8 M Euro)	183/388 M HUF (0.7/1.5 M Euro)	130/60 M HUF (0.5/0.2 M Euro)

Interim Spent Fuel Storage Facility

- Reshipment back to Russia became uncertain in the 1990s.
- Storage for 50 years, Modular Dry Vault Storage type
- 1997: Start of operation, now 4 657 SF stored in 11 modules
- 2005-2008: construction of modules 12-16
- Further 9 modules are needed by the end of NPP lifetime in 2017 (without lifetime extension)

HLW/SF disposal programme

- Boda Claystone Formation was first explored from the uranium mine.
- 1995: site selection programme
- 1998: closure of the U mine, interruption of the programme
- 2004: Re-start of the investigations from the surface to identify the site for an URL by 2016 (as a step forwards the development of a deep repository)

Radioactive Waste Treatment and Disposal Facility

- Near surface repository receiving institutional waste (20-30 m^3/year)
- 1976: start of operation
- 1998-2002: modernisation
- Disposal capacity: 5 040 m^3, practically full (storage in a technological building)
- Safety enhancement programme to recover wastes from vaults containing limited amount of concrete backfill and remove critical items (long lived-SSRS), as well as to gain free capacity

L/ILW of Paks

- Original design: storage in the NPP until decommissioning
- Decision in the 1980s: site selection for a repository by the Paks NPP
  - Investigated site first in Magyaregregy, later in Ófalu
  - 1988: public opposition against Ófalu site
  - A high-level expert committee of the Hungarian Academy of Sciences: the site is suitable but it should not be chosen against the public (Resolution 23/1989 of HAS)
  - The request for a construction license was rejected in January 1990
- Decision of the Hungarian Atomic Energy Commission in 1992:
  - A governmental project should solve the problem, as it is a national interest
  - A national-wide screening should be the first step
  - On site investigation only on territories, where the local municipality supports it
- Decision of the Hungarian Atomic Energy Commission on 17 February 1997:
  - On site investigation in Bátaapáti (alternative site Udvari)
- 1997-1998: site election investigations
- Hungary requested an expert mission from the IAEA to review the Bátaapáti site selection:
  - Process reasonable, considering Hungarian geology and public acceptance
  - Site potentially suitable
  - Site characterisation should continue, based on integrated safety assessment
- 2001: a research programme was launched
- 2003: summary report (approved by the authority):
  - The site is geologically suitable
- 2004: a research programme was approved to define the place of the repository in the host rock
- 2005: excavation of two inclined shafts started, Parliament's preliminary approval in principle
- 2006: construction of the repository in progress

Appendix 4

SOCIOLOGICAL ASPECTS OF HUNGARIAN RWM PROGAMMES: CHANGING APPROACHES AND CONFLICTS

Anna Vári
Hungarian Academy of Sciences, Institute of Sociology

Content

- Brief history of 5 siting process
- Concerns and conflicts
- Analysis of changes in the Hungarian approach
- Lessons

The Püspökszilágy L/ILRW repository

1976:	Opening (institutional waste)
1983-89:	Receiving L/ILRW from the Paks NPP
1989:	Local protest leads to suspension of waste transfer
1992:	Negotiations on financial incentives (compensation) result in agreement
1992-1996:	Resume of waste deliveries
1996:	Establishing the Isotope Information Association
2000:	Tritium found in nearly wells
2001:	Reconstruction starts

Concerns and conflicts

Focus on financial issues – incentives, fairness
No permanent authorisation, only temporary permit
The future of long-lived waste?

The attempt to site a L/ILRW repository in Ófalu

1977:	Decision on a new L/ILWR disposal facility
1983	Ófalu selected for hosting a near-surface facility – local geologists oppose the site
1987	Drilling start, plans found out by residents, protests
1988	Conflict between local geologists and the NPP experts leads to the suspension of the licensing process
1988	Government invites the Hungarian Academy of Sciences to evaluate the suitability of the Ófalu site
1989	The position of the Academy: “technically not inappropriate”, but “unfavourable in terms of social acceptability”
1989	Application for construction permit rejected

Concerns and conflicts

Secretive, top-down process, distrust
Safety concerns, ethnic problems (Ófalu and Mecseknádasd)
Extraordinary political situation – local conflicts mirror the conflicts between the regime and its opposition

The Bátaapáti Repository

1993	National Programme for the permanent disposal of L/ILRW launched – no public dialogue
1997	Selection of the Bátaapáti site – based on geological features, technical viability and social acceptance
1997	Formation of the Public Oversight and Information Association (TETT) – 6 settlements – 5 settlements opposing the facility refuse to join – information incentives
1997-98	Detailed surface surveys in Bátaapáti
2004	Subsurface in investigations
2005	Referendum in Bátaapáti
2005	Parliament gives preliminary endorsement in principle

Concerns and conflicts

No public dialogue about the National Programme, the selected disposal method, or the siting process
Focus on financial issues
Tensions between supporting and opposing municipalities
(agreement between opposing communities and the Paks NPP on compensation)

Spent Fuel Temporary Storage Facility in Paks

1990	Problems with returning spent fuel to Russia
1991	Decision on establishing a temporary storage facility
1992	Creating the Association for Public Oversight and Information (TEIT) – incentives, information
1994	Protest movement in Paks – fight against the new facility and for reduced electricity prices – failure
1994	Agreement between the NPP and the Paks municipal government – additional incentives and guarantees
1995	License issued

Conflicts

Local movement's fight for electricity price concession gains mass support
People are less interested in the fight against the new facility

Plans for establishing a HLW Repository in Boda

1992	The NPP initiates geological investigations in the area of Boda (aleurolit) – without national HLW strategy
1995-98	Second research programme
1996	Establishing the West-Mecsek Public Information Association (NyMTIT)
1998	New government orders discontinuation of surveys and flooding the mine shafts
2003	Third research programme launched (URL + repository)

Concerns

Lack of national strategy
Decisions on continuing geological, etc. investigations made each year
Negotiations between PURAM and the communities on the payments each year
Local communities concerned about unpredictable funding

Changing Approaches (1/2)

- After 1990 shift from the "technocratic" to the "market" approach
- Emphasis on negotiated agreements between the implementer and local players
- Main tools: PR, financial incentives
- Public associations for information and oversight (recently also for regional development) – facilitate co-operation

Changing Approaches (2/2)

- Support at local level (lack of interest at national level)
- Since 1990, the vast majority of conflicts are of financial nature (distribution of funds between associations, between communities, and within communities – e.g. provisions of electricity price concessions, etc.
- Debates on fairness issues – incentives vs. compensation
  (e.g., Bátaapáti vs. Ófalu; Bátaapáti vs. Püspökszilágy)
- Facilitating factors: economic recession after 1990
- When poor communities disappear, the market model may not work

Main Deficiencies

- National energy strategy insufficiently known to public
- No clear national RWM strategy (HLW)
- No clear role of OAH (regulator and policy maker, proponent of a HLW disposal facility)
- No genuine public participation – no public influence on national strategies, programmes, options, methods, or site selection processes
- One commercial NPP – four RW facilities at four separate sites?