ARCICEN / GMF conference

The challenges of new nuclear power

23 and 24 May 2024 - Saint-Vulbas

Thursday 23 May 2024

For two days, at the Centre international de rencontres (CIR) in Saint-Vulbas (Ain), members of ARCICEN and GMF came together for the first time to hold a conference on the challenges of the new nuclear era.

Keynote speeches

"Our collaboration with GMF will only strengthen our respective associations"

To open the conference organised by ARCICEN and GMF, and moderated by **Éric Maucort, 1e deputy mayor of Chinon, former Director of the Chinon Nuclear Power Plant (CNPE) and Chairman of the *Sauvons le climat* association**, it was up to the local elected representatives to say a few words of welcome. The first to speak was **Jean-Pierre Gagne, mayor of Loyettes and vice-president of the Plaine de l'Ain Communauté de communes (CC)**, who spoke of a "*rich and dynamic area, chosen to be the 3e site for the future EPR 2 pair*", while **Marcel Jacquin, mayor of Saint-Vulbas**, spoke of his community of 1.Marcel Jacquin, Mayor of Saint-Vulbas, *described his community of* 1,600 inhabitants as "*the one that has benefited most from the arrival and spin-offs of the Bugey power plant in 1965 and the industrial park from the 1970s onwards*". **Jean-Louis Guyader, Chairman of the Communauté de communes de la Plaine de l'Ain and Chairman of the Parc industriel de la Plaine de l'Ain (SMPIPA)**, praised "*an area with 81,000 inhabitants spread over 53 communes, with a spectacular attractiveness, since 1,425 new inhabitants arrived in our Plaine de l'Ain this year, and with one of the largest industrial parks in France with 9,000 employees*".

Claude Brender, President of ARCICEN and Mayor of Fessenheim, highlighted "*the starting point, with this symposium organised jointly with GMF, of a collaboration between our two associations, an initiative that comes at just the right time in the current context where nuclear power generation is experiencing a new boom in France and Europe*", mentioning in passing the 40th anniversary of ARCICEN, which was founded in 1984. "*Times have changed, but the need for information exchange between our municipalities and inter-municipalities remains as relevant as ever. I am convinced that ARCICEN will play a different but essential role in the deployment of the new nuclear power system. The municipalities and their intercommunal bodies are the essential relays that will facilitate the establishment of new power plants by acting as an effective interface between our populations and the industrialists. Our collaboration with GMF will only strengthen our respective associations*. For his part, **Gerben Dijksterhuis, president of GMF and mayor of Borsele (Netherlands)**, presented the association of local elected representatives, like ARCICEN, which was created in 2000, "*representing the voice of 16 European countries in order to increase local democracy, not forgetting new countries such as Poland and Estonia, which are holding discussions with us. We have also worked for a global partnership of nuclear communities. We are the representatives of civil society, representing citizens. New movements are emerging and that's a good thing. We have the opportunity here in Saint-Vulbas to share your knowledge and experience*.

"We are in the midst of a global nuclear revival"

After the welcome, the second part of the morning looked at the nuclear landscape in the world, Europe and France. It was then the turn of **Valérie Faudon, General Delegate of the Société Française d'Énergie Nucléaire (SFEN) and Vice-President of the European Nuclear Society**, to present the various new nuclear options. Prior to this, the General Delegate was keen to highlight the positive attitude of public opinion towards this energy in an annual survey carried out for EDF. "*We're seeing a huge jump of 10 points on average worldwide in 2022, linked to the energy crisis, particularly in Europe, and confirmed in 2023. We should also mention the visibility of nuclear power in international bodies, as mentioned in the final agreement of COP 28 in Dubai, with a declaration by 20 heads of state in favour of tripling the world's nuclear fleet by 2050, which is a major step forward and sets the tone for today's atmosphere*". To achieve this, it will be necessary to keep the current fleet, but also to build large and small reactors.
In the midst of the global nuclear revival, Valérie Faudon then reviewed a number of countries to illustrate her point, including the United States, "*which has the largest nuclear fleet in the world, with plants extended to 80 years, and innovative reactor projects with extremely high levels of investment*"; China, "*a champion in the construction of large reactors in series, with 10 new reactors in 2022 and a further 10 in 2023, investing in all technologies*"; Europe, "*which is undergoing an extraordinary turnaround, in which France has been very active, with the Alliance of 15 nuclear countries setting a target of 150 GW by 2050. It's a real change, with nuclear power having been given the same status as renewable energy, something that will have to be put into practice in the next term of office*".

Finally, France has 4 major reactor programmes. In addition to the major refurbishment, there are the large reactors (the EPR 2), the Nuward SMR (2x170 MWe) and the AMR (small innovative reactors). "*The EPR will be designed to produce a lot of electricity, while Nuward is intended to produce a variety of applications, electricity, heat or hydrogen in industrial basins. The challenge will be to identify these sites. Finally, as part of the Energy-Climate consultations, we asked for at least 25 GW of new build without specifying the mix and two pairs of Nuward with the hybrid model and 2 AMR prototypes*", explains the Managing Director.

"The EPR 2 is the performance of the EPR, simplifying construction with an industrial and replication approach"

Nicolas Machtou, Director of EDF's New Nuclear France Programme, went on to describe the EPR 2 programme in detail, beginning with its history. "*This is a programme that is both very old*

(early 1990s) in terms of EPR technology, and very recent, with the passage of time accelerating (Paris agreements, PPE, EDF proposals in 2021, RTE assumptions for 2050 and the Belfort speech) to lead, first of all, to the decision for a series of six reactors, built in pairs". The programme has three objectives: to contribute to the decarbonisation of the economy and meet new needs for low-carbon electricity; to enable France to pursue a sovereign energy policy; and to develop employment and re-industrialisation in the regions. All that remained was to give a definition: "*An EPR 2 is an optimised and industrialised version of the EPR, with an equivalent safety framework. It incorporates all the performance of the EPR, while simplifying construction in an industrial context and replication on the same site*", continued Nicolas Machtou. Three sites have therefore been selected, following an examination of technical criteria and social and political acceptability: Penly will start the series, followed by Gravelines and Bugey. In the provisional timetable, the programme is designed to start now, with skilful coordination from one site to the next, and to finish in the early 2040s.

"After the public debate at Penly (the other two will follow), work on the non-nuclear projects is expected to start in the summer of 2024 and on the nuclear projects in 2027," says the Director of EDF's New Nuclear France Programme, who was keen to highlight the French nuclear industry, "*France's 3ième industrial sector, with 220,000 employees, is a sector of excellence and a major job creator, with 10,000 to 15,000 people expected to be recruited every year for the EPR 2 over the next ten years. One of EDF's biggest challenges is to play a major role in the country's recovery by attracting young and not-so-young people to new training courses*". Work remains to be done on the "major worksite" scheme, which offers local authorities many opportunities but also constraints. "*A regional action plan is in place to mobilise local players to ensure that the EPR 2 project is successfully integrated into the local area, in the same way as the EPR project in Flamanville*.

Advanced Modular Reactors (AMR)

"The technology fits into two 40-foot containers, one of which has a nuclear reactor"

At the end of the morning, David Briggs, Deputy Managing Director of NAAREA, a French company providing energy access services on an industrial scale, presented the technology that his company is promoting. "*Unlike the EPR 2, we are talking about a small object, an x-AMR for extra-small, a micro power plant: we use used fuel from nuclear power plants to produce heat and electricity using a 4e generation reactor for industrial use by setting up on sites of this type and delivering energy directly to our customers*". The project began in 2020. Faced with growing energy demand and production resources, all types of nuclear power will be needed. "*We are proposing a solution that is as close as possible to the users, which will relieve the grid, accelerate the decarbonisation of industry and use used nuclear fuel.*

The technology is contained in two 40-foot containers, one of which contains a nuclear reactor (using molten salt, which regulates itself without the need for water). To achieve this, we're going to work in series (with production of around 10 to 15 reactors a year) as part of a centralised factory construction process to ensure rapid deployment with very limited civil engineering requirements. Finally, we're not selling a technology, we're selling energy as a service, giving our

industrial customer access to energy under a long-term contract (between 10 and 30 years), with no speculation and a stable price".

The micro power station will be able to produce very high temperature heat and/or electricity, depending on the mix required, using very high quality waste heat. "*We've worked in the region with a number of industrial companies that have major electricity and heat requirements, and with local authorities to electrify ports, hospitals, transport and district heating, for example. Given the needs and the urgency, the aim is to be able to deliver the first reactors in 2030*", concludes the head of NAAREA (220 employees). Initial contract discussions have already begun.

"The new European Industrial Alliance for small modular reactors"

At the end of the morning session, Berta Picamal, Nucleareurope's Director of Legal Affairs and International Relations, reminded the audience of the many needs required for the development of nuclear power. "*We need everything, there is no opposition between the different technologies, including renewable energy. We also need consistency, stability and a long-term view in the positions we take. As for the change in Europe's attitude towards nuclear power, it is noticeable, particularly with the example of Italy, which now wants to go down this route*". Finally, on the subject of the 64-year-old Euratom Treaty (European Atomic Energy Community), *"yes, it exists and it is the legal basis for moving forward. We need to invest in nuclear power," says Article 2*.

In her speech, Berta Picamal repositioned Nucleareurope as the voice of the nuclear industry in Europe, made up of 15 members and 100 reactors, representing 1 million jobs, 23% of electricity production and a turnover of 100 billion a year. "*As part of the new European industrial alliance for small modular reactors, we have set up various working groups on different topics, bringing together all the stakeholders to facilitate deployment in the early 2030s. GMF's role is going to be key in this development, bearing in mind that the European Commission's attitude has really changed*."

Thursday 23 May 2024

Afternoon

Round Table

Land preparation and commitment -

How can local authorities be prepared to welcome the new nuclear power?

"With CIGEO, the timeframe is too long"

Discussions resumed in the afternoon with **Michel Loisy, President of the Communauté de communes (CC) des Portes de Meuse** (51 communes and 16,500 inhabitants), to talk about the

Bure - Cigéo experiment in deep geological disposal, which began in 1991 with the Bataille law setting out the broad guidelines for research into the most radioactive waste. "*The project began in 1999, when the government decided to build a laboratory 500 m deep on the border between Meuse and Haute-Marne. The ASN considered that deep geological disposal was "a definitive management solution that cannot be ignored". In 2006, the law confirmed the reversible deep disposal of high and intermediate level long-lived waste. In 2009, ANDRA defined the ZIRA (Zone d'Intérêt pour la Reconnaissance Extérieure), a 30 km2 area to house the underground facilities, close to the underground laboratory. In 2011, the industrial design of the future centre was launched and given the name CIGEO (Centre industriel de stockage géologique). The law of 2016 defines the notion of reversibility as the ability to "continue, change or stop construction and operation and to be able to reassess previous choices*". In 2022, the DUP will be published and in 2023 the application for authorisation to create CIGEO will be submitted.

"Our Community of Communes is anticipating and preparing for the future by being involved in supporting the project (infrastructure, schools, etc.). We have a GIP with a budget of €30 million, 50% of which must be spent in the region. Our CC is also involved in training, with POCES (Pôle de compétences en environnement souterrain - Underground Environment Skills Centre) to train people for the jobs of the future. We're talking about 2,000 jobs over 7 or 8 years for the project and 500 people working on its operation. We also have a 70-hectare site for a business park. But we have to deal with a lot of pressure from opponents, a project that straddles two départements and a timeframe that's too long. It's dragging on too long. If all goes well, tests will be carried out with the first inactive packages between 2035 and 2040.

Finland: "confidence takes time”

An international panel of foreign elected representatives then took the floor, starting with Finland's **Vesa Lakaniemi, Mayor of Eurajoki, home of the Olkiluoto power plant** (3 reactors, including an EPR) and the Onkalo HA waste disposal site, who spoke about the lessons learned from Eurajoki concerning Olkiluoto 3 and the Onkalo geological repository. "*The most important thing for us is safety. We believe that risks must be minimised. That's why we have independent authorities to ensure a very high level of safety and security. We pride ourselves on this, and everything is done to the highest standards. Secondly, we have been promoting open and transparent cooperation with a cooperation group between the municipality, the energy company TVO and the radioactive waste management organsiation Posiva since 1995. Many seminars and information sessions are organised, which is very positive, as the municipality has a right of veto. We are better informed locally than nationally. It takes time to build trust, and that takes time*. TVO and Posiva pay real State taxes to the municipality and in this situation, it is easy to make long term plans as there is an stable revenue.

Netherlands: "We talked to the people to get them involved"

Frank van Bussel, environmental manager for the energy transition in Borsele (Netherlands), spoke about the consultation with civil society on new nuclear reactors in Borsele. Situated near the North Sea, in the south-west of the country, the town already has a small power station (500 MW), the country's only nuclear power station, commissioned in 1973. Since 2022, the government has been planning to install two new nuclear power stations in the same town. "*We*

spoke to the local population to get them involved. We set up a group made up of equal numbers of men and women, with 50% under the age of 35. 100 people were selected to draft the terms and conditions of the new eneregy projects in Borsele. Additionally, 15 local experts have supported the group with their knowledge and experience in diferent topics. A group of 7 people went to Hinkley-Point C. This process really helped; it's important to talk to everyone. In a unique process, the Conditions Group in Borsele has developed 39 terms and conditions which were presented to the Ministry of Energy and Climate. The lessons we've learned are: be proactive, don't wait for someone to do it for you, you have to get your community involved. What guides people is improving the quality of life, not being for or against the project. It's also important to get the younger generation involved and to communicate actively in the media. The terms and conditions established in 2023 will be examined to verify that they are still valid and if additional information is needed. In 2025 there will be a negotiation with the central government, which will take a final decision on the site and the company chosen to build the reactors.

United Kingdom: "A lot can be done if we work together and the process is transparent"

After the Netherlands, **Douglas Bamsey, consultant - housing, major infrastructure, employment -** stops off in the UK to draw lessons from Hinkley Point C (two new EPR-type reactors) and Cumbria. "*I've been involved in this project since 2010, and it's been a long one, taking no less than 15 years to build. It's not just about producing energy, it's also about jobs, training, transport and housing. It's a project that can transform lives in a region where jobs are in short supply. We've done a lot of local work, because projects of this scale don't come along every day. In our region, this was the 1er nuclear project since the 1980s. We listened to and defended the voices of the communities. The process is long and complicated. There have been disagreements with EDF, but the project, which has been put back to 2029 and has changed enormously, must succeed. It's important to plan and work together at all levels*.

David Moore, Cumberland councillor and chairman of Nuleaf, which has over 100 local authorities and national parks as members, works with the UK and Welsh governments, the Nuclear Decommissioning Authority (NDA), Radioactive Waste Management (RWM), regulators and the wider nuclear industry. Nucleaf works on strategy, policy and practice in all areas of nuclear decommissioning and waste management. Created in November 2003, the Special Interest Group (SIG) on radioactive waste management and nuclear decommissioning became the Nuclear Legacy Advisory Forum (Nuleaf) in 2005. Among the sites, Sellafield (6 km2), on the Irish Sea, is considered to be the largest plutonium site in the world (opened in 1947). It is the UK's main nuclear power complex, with the Sellafield Mox Plant (SMP), which opened in 1997 to produce MOX fuel. "*The government has been asked to give its vision for the site. A major nuclear project could be built nearby. We're also working on SMRs. It was the community that went to the government to push things forward. There's a lot we can do if there's transparency*," says David Moore.

Sweden: "*Back home, we don't just love Ikea, we also love our storage methods*"

The case of Sweden was then presented by **Fabian Sjöberg, Mayor of Östhammar (Sweden)**, the town where the Forsmark nuclear power plant (3 BWR reactors) and radioactive waste final disposal centre are located. His speech highlighted the municipality's preparations for the final disposal of spent nuclear fuel. "*We don't just like Ikea in Sweden, but also our storage method. We are open and transparent with the authorities. If a municipality says no, we can't force it. We have experts in the local authorities who read everything and know how to answer questions. We can say that we've done a good job*," he explains. As proof of this, an annual survey commissioned by the Swedish waste management company Svensk Kärnbränslehantering AB (SKB) shows that 86% of residents in the municipalities concerned support the construction of an encapsulation facility at Oskarshamn and a geological repository for spent fuel assemblies at Forsmark (municipality of Östhammar). This time, the 2023 survey showed support in excess of 90%, with the residents of the two municipalities concerned believing that the project will make a significant contribution to the development of the region. "*The key factors are: well-defined roles, transparency and a local presence*," says a delighted Fabian Sjöberg.

The three EPR 2 sites

The cases of the three sites

selected for the future EPR 2 in Francewere presented,

each with its own particularities

"The problems begin”

First, **Jean-Louis Guyader, President of the CC de la Plaine de l'Ain,** spoke about the situation at Bugey in terms of preparation and the challenges facing the region and the operator of the nuclear power plant. "*The joy of having been selected, after the whole region mobilised to showcase our strengths, is still there, but the problems are beginning*. While waiting to find a name for the future power station, Bugey has three demands: "*The first is accessibility to the site. We need an additional crossing of the Rhône. We also need a new motorway junction. Finally, the 27 km railway line, which runs to the power station but now only connects one plant (as opposed to 24 in the past), should be relaunched by the government as it could be a source of intelligent mobility. The other request relates to housing, as it will be necessary to build to accommodate new residents. We are prepared to do this, but there is the problem of ZAN (Zero Net Artificialization). In addition to the 220 hectares earmarked solely for the EPR 2 and taken from the national quota, the government has earmarked 150 hectares for housing and roads. Finally, there is the challenge of education. Training for the regions is also a top priority. It's important to bring university closer to the regions, because young people in rural areas are censoring themselves by not going on to higher education*.

"Numbers that make you dizzy”

Bertrand Ringot, Mayor of Gravelines, Vice-Chairman of the Dunkirk Urban Community and Vice-Chairman of the Côte d'Opale Metropolitan Cluster, in charge of Water and Maritime and Coastal Issues, followed to present the case of Gravelines in terms of coordinated territorial action at PMCO level in the run-up to the EPR 2. *I'm speaking mainly on behalf of the Metropolitan Cluster because we're located in the middle between Calais and Dunkirk. So we've set up working groups at this level, which I'm coordinating as referent, involving the Region, the State and the CCI, with one person to organise governance, to prepare us for the arrival of the project. Gravelines currently has 9,000 employees and 12,000 inhabitants. Tomorrow, over the next 10 years, we're going to have 20,000 / 30,000 employees, including the EPR 2, the 3 battery plants and the extension of the western port. These are staggering figures, within a constrained area. There is a real challenge in terms of accessibility (doubling the railway line) and housing. We could create 10,000 if we take into account the issue of brownfield sites and the use of ZAN. Not forgetting the problem of attractiveness. We're waiting for a Grand Site Prefect to be appointed, and for him to be included in the platform that we've set up, without recreating a new mechanism. We're getting organised, we're happy, but we're aware of the difficulties and the amount of challenges we have ahead of us, and we don't have any problems of acceptability with 6 tranches already in place*".

"There will be specific taxation for EPR 2"

After Bugey and Gravelines, the floor was given to Penly, the 1er site where the 1ère pair of EPR 2 reactors will be installed. **Patrice Philippe, Mayor of Petit-Caux and Chairman of the Communauté de communes des Falaises du Talou,** outlined the history of the project and relations with neighbouring local authorities. "*At the outset, it was complicated because we had to move forward in disguise. At the time, there was no question of relaunching the nuclear industry, so the Region took the lead with the Department and the local authorities, but without the State and without the order from EDF. We set up a project group because we wanted to work on the reception and acceptability of the site. We were told that the project would employ 8,000 people, 50% of them local. Even then, we didn't think it was going to be easy on the roads. Now we're talking about 10/11,000 people. Our major problem is land. We don't have any wasteland, just farmland, while 5 projects are colliding at roughly the same time: alongside the EPR 2, which needs* 150 hectares outside the power station*, we have a 62-machine offshore wind farm with cable landing (which takes up 10 hectares), a transformer to be rebuilt outside the power station (also 10 hectares), a 3e 400,000 volt line and a secondary road to be upgraded from 3 to 4 lanes. In view of this, we have bought land to make it available, which is not without its problems.* With regard to the taxation of future EPR 2s, an interministerial task force has been appointed to devise an appropriate tax system based on the principle *that* "*it is essential to share tax resources fairly between local authorities*". For the elected representative, "*there will therefore be a specific tax system for EPR 2*". The only problem is that the analyses and proposals were due by 1 April 2024... To be continued.

Conclusion

"We are in a war that is above all about energy"

At the end of the day's discussions, **Bernard Accoyer, former President of the French National Assembly and President of PNC (Patrimoine Nucléaire et Climat) France,** concluded. "*The challenges of the new nuclear power, which concern local authorities as well as the energy, economic and industrial future of our country and the European Union, are absolutely major. Energy, accessibility and cost are at the heart of everything. Yet we can only be amazed at the mistakes made by the European Union and a large number of Member States, which for 25 years have allowed us to believe that we could live on illusions and utopias instead of scientific realities and the technologies developed, such as, for example, imagining a 100% renewable electricity mix*".

He goes on to point the finger at the role of lobbies and NGOs, "*with sulphurous funding*", which have led to this situation. "*They ended up impressing public opinion and exploiting fears. However, the production sites for this low-carbon energy are vital for industry and must benefit from derogation provisions. To achieve this, we need to revise a number of laws (ZAN, etc.) that are paralysing their development and their planning. Laws are there to be changed. We are in an economic war, but above all an energy war*". To achieve this, there needs to be transparency, dialogue and investment in information and training.

A number of conditions must be met to meet the challenges of this new nuclear energy. "*First of all, in the governance of States: we need coherent decisions over a long period of time, based on indisputable studies and scientific assessments. Secondly, the reality and objectivity of the different energies need to be asserted. The word "intermittent" has been forgotten by those who wanted to lull governments into complacency, just as there is no mention of the costs that will increase and converge towards the consumer, whether industrial or household. In France, controllable production capacity has been reduced by 12 GW over the last ten years or so; in Europe we are going to lose 100 GW. At the same time, intermittent renewable energies are set to grow: in France, from 37 GW to 152 GW in 2025, and in Germany from 150 GW to 730 GW in 2045*".

A word of warning from Bernard Accoyer. "*Tomorrow, the proportion of controllable power will not be sufficient to ensure the stability of the network. On this subject, PNC France is calling for a serious preliminary comparative study to be carried out before embarking on investments at breakneck speed. Fortunately, Europe is clearly changing course under the pressure of rising prices. We must take advantage of this. I remain optimistic after this European nuclear winter, hoping for a return to common sense and reality. The overriding priority is to have an electricity mix that meets climate, energy, economic and social imperatives. In this respect, ARCICEN is indispensable in defending these issues*.

Friday 24 May 2024

Morning

The development of new nuclear power in Europe

"We need to create strategic autonomy in Europe"

At the end of the ARCICEN / GMF conference and before leaving to visit ICEDA in Bugey, **Jan Panek, Director of Nuclear Energy, Safety and ITER at the European Commission's Directorate-General for Energy,** spoke about the development of new nuclear power in Europe. "*A new landscape in favour of nuclear energy is emerging in Europe, which already has 100 reactors, most of them in France. New countries (Poland, Estonia, etc.) are showing an interest, and nuclear power is a very important part of the decarbonisation process.*
Admittedly, it's not easy to reach a consensus, but attitudes have been changing in recent years, with a wider recognition of the importance of nuclear power.

Drawing on the texts (the Euratom Treaty, the Environmental Impact Assessment Directive, the Directive on public participation and the latest European Nuclear Energy Forum), Jan Panek continued. "*The Commission's role is to ensure that the countries that use nuclear energy do so in complete safety, for workers, the general public and the environment, both during and after the activity. We will continue to insist on higher safety standards. The important thing is that throughout the life of the project, there should be no burden for future generations. So we need both safe and responsible management of spent fuel and decommissioning, which must be an integral part of every project. For example, Europe is funding and supporting the decommissioning of three power plants in 3 Member States, Lithuania, Bulgaria and Slovakia. Similarly, there must be security of supply to ensure that sources are diversified so as not to be dependent on a single supplier. It is important to create strategic autonomy in Europe and to continue to invest and train, because skills development is fundamental. This is an issue for all countries. As far as SMRs (Small Modular Reactors) are concerned, the Industrial Alliance set up by the Commission for them in November 2023 is a step in the right direction. There are around 80 types of innovative small modular reactor in the world. They are the future and we need to have them in place by 2030. I insist: strategic autonomy in Europe must remain a global objective*.

The morning ended with a visit to the Bugey nuclear power plant.