Northern Ireland Assembly

Environment Committee

Thursday, 2nd April 2008

North / South Interconnector

Submission by the North East Pylon Pressure campaign (NEPP)

Dr. Padraig O'Reilly (NEPP):

Chairman, members of the Committee.

It is indeed an honour to be here this morning to offer expert evidence to the Environment Committee on the critical issue of the best way of transmitting high power electricity between North and South – an issue that not only affects us, but future generations as well.

I want to thank you and the Committee members for your invitation to attend today. I also want to acknowledge the courtesy and assistance afforded to us by your Secretary, Dr Alex McGarel and your Assistant Secretary, Mr William Long, in making the necessary arrangements.

The North East Pylon Pressure (NEPP) campaign is a community-based organisation across the three counties of the Republic affected by the joint NIE / EirGrid proposal. We derive our mandate from the 45,000 people, organised in about thirty local committees, who favour underground cables as the means of electricity transmission. We maintain links and co-operate closely with our friends in the SEAT campaign.

Initially we had – and still have – serious concerns about the effect of pylons and overhead lines on human and animal health, on the environment, on our heritage and archaeology, on farming and bloodstock enterprises and on tourism. However, since we started our campaign in November 2007, and as we studied the research and the practice in other countries – helped enormously by Professor Noack who is here to brief you today – we have learned that, compared with overhead lines, underground cables are better value in the long run, more reliable, safer, more environmentally friendly, and they do not carry with them all the other real economic costs like devaluation of land or property and loss of farm output.

I do not wish to pre-empt what the Professor will say. However, I disagree with the comments made to you recently by the Utility Regulator, Mr Osborne, where he claimed that underground is more expensive and less reliable than overhead. As the Professor will demonstrate, improvements

in cable manufacturing and trenching technology mean that the capital cost of underground is reducing rapidly and is converging on overhead. However, when the two systems are compared in terms of the cost of electricity lost to the environment, the losses on overhead far exceed underground over the life time of the project. The effect is to make underground less costly than overhead and, therefore, better for the consumer.

Internationally, countries like Denmark, Germany and the Netherlands are moving increasingly towards the type of underground Alternating Current (AC) cables we propose for the interconnector. The conventional wisdom among the world-class electricity system operators is changing. In five years – certainly in ten years time – those who claim that overhead is cheaper than underground will be regarded with the derision similar to those who once earnestly believed that the earth was flat or that the sun orbited around it.

NEPP favours increased interconnection. We want to see the renewable wind and wave resources that exist in abundance off the coasts of this island harnessed to power our homes, farms and businesses, to become a net exporter of energy, to replace imported fossil fuels, to create businesses, profits and jobs for thousands of our people.

One leading expert has estimated that the island of Ireland has enough wind power off our coasts to power the island ten times over. The way is open for us to be up there with Denmark, Germany and the Netherlands as the world leaders in generation of electricity from renewable resources. But to achieve that, we must have a high power transmission system that is cost effective, reliable and acceptable to the people on health and environmental grounds. That is why, for example, political parties in Denmark adopted a political consensus that ensures that all their future high power cables will be underground. Their system operator, Energinet.dk, carried out a major technical study and concluded that utilisation of offshore renewable energy is inextricably linked with onshore underground cables.

That is why we sometimes feel frustrated when we see the slowness of NIE and EirGrid in the South in adopting the underground solution. However, today is an important first step for this Assembly to point way forward for both companies. Because of your planning laws, and the role of the Minister for the Environment in the final decision you have a huge advantage over us in the South. You have democratic input and accountability in the planning of strategic infrastructure. You have it in your hands to stop overhead for the benefit of all us. Because if the decision in the North is to go underground, then it is inconceivable that the lines would then go overhead when they reach the Border.

The ASKON report on the comparative merits of underground versus overground transmission is the first project specific analysis of determining the feasibility of undergrounding the North-South interconnector. The costs reported in the study do not take account of the undoubted substantial compensation costs arising from land and property devaluation. The commercial costs from probable years of planning delays, objections and associated legal costs, have not been included in the study.

I will now introduce Professor Friedhelm Noack, who will take you through the main findings of our study.

ASKON Report – Professor Friedhelm Noack:

Chairman and Committee Members,

Thank you for the opportunity to present the details of our study here today.

I will start by outlining the methodology used in setting the framework for the study. We firstly analysed the existing parameters and constraints for transmitting electrical power in Ireland. This included analysis of relevant reports produced by EirGrid. We then examined specific reports relevant to the North-South interconnector project, such as the Ecofys study and NEPP group submissions to the Ecofys study. The ASKON study does not

summarise other general overviews and desk studies. Finally, the project route area was visited and examined both aerially and by land.

The ASKON report is the first project specific analysis of determining the feasibility of undergrounding the North-South interconnector. ASKON examined the feasibility of undergrounding using EirGrid's benchmark criteria of affordability, reliability, safety, efficiency and security.

There are a number of findings in our study, but the main findings and recommendations are as follows:

A design consisting of two groups of Underground Cables running in parallel is recommended for the transmission system, as an alternative to the planned Overhead Lines single system. The design consists of using two groups of aluminium cables entrenched in parallel to each other. The two trenches are 1.4 metres in width and in depth and situated 5 metres apart.

The Underground Cable solution is better suited to integrating with the existing grid network than the proposed Overhead Line system, as defined by a well established International Standard for evaluating operational security and power disturbances ("N-1 criterion"). Undergrounding enhances national grid security and reliability, compared with Overhead Lines, and gives improved performance in the grid.

The Underground Cable solution is significantly more reliable than its equivalent Overhead Line option, whether in conditions of either planned or forced outages. Failures in Underground Cables are significantly lower than in Overhead Lines, which are permanently affected by the climate and environmental conditions (sun, wind, rain, fog, snow, ice, pollutions, and lightning strikes) and thus the components age.

When a failure occurs in Overhead Lines, the transmissible power of the system is zero. Statistical data and statistical reliability analysis, however, shows that the probability of an Underground Cable failure is very low. The longer time it may take to repair an Underground Cable is eliminated by having two cables in parallel, as is the current practice around the world.

The probability of both parallel cables being unavailable is once in every 100,000 years. The decisive advantage of the two parallel Underground Cable systems is the redundancy of one cable system, which has, together with the overloading performance of the cables, remarkably favourable advantages over the Overhead Lines regarding availability and security.

The Underground Cable system is significantly more efficient than the equivalent proposed Overhead Line system. Transmission losses over the lifetime of the Underground Cable system are significantly lower than for a single Overhead Line system. This translates to a significantly better carbon footprint profile than the Overhead Line system.

The Underground Cables system is significantly safer than its equivalent Overhead Line system. No electric fields are emitted from the Underground Cables. Importantly, the magnetic field is also greatly reduced. Underground Cable routes can, if necessary, be placed within 11-17 metres from dwellings versus 95 metres for Overhead Lines, in order to comply with exposures below the 1 µ Tesla level. Many European countries (for example, Italy, Switzerland and the Netherlands) have, based on research related to childhood leukaemia, set safe precautionary levels for human exposure to Electro Magnetic Fields (EMF). The EMF field from an overhead electricity line cannot be shielded and humans need to be more than 90 metres from the line to meet the precautionary safe reading of 1 µ T. In contrast, even during peak loads, the EMF density above underground cables reduces to 1 µ Tesla after only 11 metres distance. Short term exposure by walking or working above cables is harmless.

The Underground Cable system provides obvious environmental benefits versus Overhead Lines, in terms of land use, visual impact, land and property valuation and tourism and heritage responsibilities.

The identified Underground Cable system can be established at an affordable cost when compared with an Overhead Line option. There is a higher initial investment cost, but this difference is cancelled out by the much higher losses of electricity in Overhead Lines over a 40 year life cycle.

None of the cost estimates take account of the costs of lengthy planning delays for Overhead Line approvals, the land and property devaluation impacts and the effects on tourism and heritage. Notwithstanding these aspects, the worst case scenario for implementing the Underground system would be a cost of €1/household per year over the project lifetime.

Concluding Remarks – Padraig O'Reilly

NEPP believes that the work of Professor Noack and the ASKON study is a significant contribution to the debate that must be had in relation to electricity transmission.

Mr Chairman, we came here today to present our case as best as we know it to be at this point in time. We are fully aware that there have been challenges in long distance underground projects, but technology is moving ahead rapidly and we believe the contributions from our experts and the Danish developments indicate that these challenges are far from being insurmountable. The new political consensus in Denmark on undergrounding of all future electricity transmission cables is a significant pointer to development of policy.

It is not so long, Chairman, since you and your colleagues showed how Northern Ireland could be an example to the rest of the world in the work of peace. Now is your chance to show leadership to the world in the vital fields of renewable energy as well.

Thank you.