Northern Ireland
Assembly

COMMITTEE FOR THE ENVIRONMENT

OFFICIAL REPORT (Hansard)

Depolymerisation: Best Practice

8 December 2011

NORTHERN IRELAND ASSEMBLY

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Members present for all or part of the proceedings:
Ms Anna Lo (Chairperson)
Mr Simon Hamilton (Deputy Chairperson)
Mr John Dallat
Mr Danny Kinahan
Mr Peter Weir

Witnesses:

Dr Gillian Bruton	) DEPOTEC Project
Dr Eamon McKeogh	)
Mr Colm Conyngham	) Bridgestone Ireland Ltd
Dr Isabelle Kurz	) Environment Protection Agency

The Chairperson:

We now have Gillian, Eamon and Isabelle. Thank you very much for coming. We also have Colm staying with us for a bit. If you could give us a 10 to 15-minute briefing, I will then open the floor for members to ask you questions. We also have your information pack, which I was reading last night.

Dr Gillian Bruton (DEPOTEC Project):

My name is Gillian Bruton, and I am the project manager for DEPOTEC, which is the

depolymerisation technology for rubber with energy optimisation to produce carbon products. I am a research fellow at University College Cork. I have a PhD in chemistry and a masters in energy engineering. I have 11 years' industry experience in process development, certification, technology transfer and start-up. My colleague Dr Eamon McKeogh, is the director of the Sustainable Energy Research Group (SERG) in University College Cork.

The DEPOTEC project is funded by the LIFE+ programme, which is the EU's funding instrument for the environment. The general objective of LIFE is to contribute to the implementation, updating and development of EU environmental policy and legislation by co-financing pilot or demonstration projects that have European added value.

The project partnership for DEPOTEC involves Erneside Engineering, which is the co-ordinator of the project. It is a Cork-based company that is involved in electrical and mechanical design and installation, and it has previously invested in research and development of new renewable sources of energy such as pumped-storage, wind, solar and hydrogen. The other partners in the project are a Polish company, whose primary purpose is in the depolymerisation process development, and the Aristotle University of Thessaloniki, which will look at adding value to the carbon products produced during the process. University College Cork will look at the life-cycle analysis, policy and regulation, energy modelling and the economic evaluation.

The main objectives of the project are to identify the barriers that have affected the development of the process for end-of-life tyres (ELT). We want to understand the economic road blocks that have prevented its previous exploitation, and we also want to understand best practice and incorporate the process development and design energy optimisation methodologies and the planning and construction of the pilot plant into the end-of-life tyre management. We plan to identify the most effective testing procedures for gauging the quality of the materials that are produced from end-of-life tyres, and to develop new markets for end-of-life tyre products, with a focus on life-cycle analysis.

The composition of a tyre is complex. It contains 30 types of synthetic rubber, eight types of natural rubber, eight types of carbon black — we like to call it black carbon — nine types of silica —

The Chairperson:

What is carbon black?

Dr Bruton:

It is the reinforcement material. I suppose that the tyre guys could talk a lot more about it.

Mr Colm Conyngham (Bridgestone Ireland Ltd):

It is like a glue. It helps to hold everything together.

The Chairperson:

OK.

Dr Bruton:

It offers a huge amount of properties, and I will talk a little bit more about those later.

Compared with other sources, tyres have high energy content, and that is what makes their use in things such as energy recovery, as alternative fuels for cement kilns, paper pulp mills and as a substitute for coal in steel plants, so interesting. From a materials recovery perspective, tyres are used as construction materials for embankments, as road insulation, for erosion control and, as you probably heard this morning, for crumb or ground rubber applications such as rubber modified asphalt, running tracks, equestrian tracks etc.

Depolymerisation is the chemical conversion, or breakdown, of organic compounds by heating in the absence of oxygen. In this case, it produces four products — a gas, an oil, a char and a steel — that can be used in a multitude of areas such as energy. It can also be used as a chemical feedstock in carbon products and in steel reprocessing.

Over the past two decades, numerous depolymerisation facilities have started up and failed, and a number are currently in pilot or demonstration scale. Depolymerisation technology is not new, and it has been there since the 1970s. The DEPOTEC project plans to look at the factors that have affected the use of end-of-life tyres in the depolymerisation process. We will look at everything including the technology; the technology economics; the reliability of supply; the end-of-life tyre management structure; the standards and restrictions on end-of-life tyre use and disposal; and the infrastructure that is available to allow the reuse of the materials.

A brief diagram in your packs shows the process. As I said, it is a thermal degradation process without the addition of oxygen. It is done through the application of heat, and it is a highly energy intensive process. Four products are produced: carbon black, or black carbon, because we can never go back to the original carbon black material; an oil; a gas; and a metal. Those can be produced in various quantities depending on the reaction rates, and the product ratios can be varied depending on the temperature, the residence time, the heating rate, pressure, degree of heating, feedstock catalysts and a multitude of other things that we will examine during the process development.

The key issue is that the depolymerisation gas has a high gross calorific value so it is sufficient to be used again in the process. Depolymerisation oil could also be used as a conventional fuel if a number of adjustments were made to it. We will look at the issue of upgrading the black char, or black carbon, which is produced during the process.

Although extensive time will be spent on the development of the depolymerisation process, we realise that that cannot be evaluated in isolation. We will look at a number of factors that will affect the economics of the overall process. They are as follows: security; location of supply; existing markets; market availability; location; process development costs for the environmental requirements around process design, planning and policy; the pretreatment costs involved before it goes into a rotary kiln, which is the furnace that we propose to use; equipment and infrastructure costs; and operating costs, because, as I said, it is a high energy-intensive process, and the products have to be purified after they are made. As it is quite an energy-intensive process, the location of the plant and energy costs will have a huge impact on the process. We will also look at product post-treatment costs. If a product is created, you will obviously want to make sure that there is a market for it. Many issues will impact on our getting the product to market. Some are to do with legislation and waste management enforcement, so we will look at the cost and the long-term viability of the depolymerisation process.

We need to ensure that ELTs can be disposed of through authorised, certified disposal routes. Legislation should govern the operation of ELT transporters, sorters, storage facilities and process facilities because those will impact our security of supply. Legislation should recognise ELT-derived products as alternative energy sources or secondary raw materials with respect to criteria identified and certified through regulations. The right enforcement procedures must also be put in place to make sure that the legislation is respected.

Life-cycle analysis, which has become an integral part of many strategies on waste management, will be looked at in detail throughout the process because it is, as I said, a high energy-intensive process. We will, therefore, look at the total primary energy consumption, consumption of non-renewable sources, water consumption, emissions of greenhouse gases, and so forth.

During the DEPOTEC project, extensive work will be carried out on the life-cycle assessment of the depolymerisation of waste tyres. We will conduct comparative analyses of the depolymerisation option versus existing techniques. We will, all the time, double-check to make sure that the process makes sense economically and from a life-cycle analysis perspective.

As far as end market development is concerned, we will look at the extensive properties of black carbon, which offers products protection from UV light. It also increases thermal conductivity and protects against thermal degradation. So when we look at the markets for the product that we are creating, we will consider the properties of that product and the markets that we could get into with it. We will also look at the current supply chain for ELTs and at whether there is a demand for the existing products as well as for new ones to enter the market. Are there regulations that will allow the development of a proposed market for ELT-processing technology, infrastructure and market development? Is that market viable in the long term?

As far as product certification is concerned, we have already started working the European Tyre Recycling Association (ETRA). We are looking at the current technical specifications for end-of-life tyre products and are trying to understand the potential barriers in the existing policy and legislation and with entering new products into the market.

That is a summary of where we currently are with the DEPOTEC project. We started only in September, so we are just three months into the project.

The Chairperson:

Thank you very much for your presentation. I forgot to say that I am Anna Lo, Chair of the Committee for the Environment. Obviously, it is a very new process. Congratulations for starting it. We very much need to explore new ways to help the industry that could make the recycling of tyres more viable. You mentioned costs, and obviously you want to prove that enough money can be made to make it economically viable. What are the environmental issues?

Will it have a negative impact on the environment?

Dr Bruton:

Our plan is that it will not have a negative impact on the environment. The process is done in the absence of oxygen, and there are plenty of existing published studies on depolymerisation process technologies. Some are positive and some are negative, and we are already engaged in trying to understand the legislation and the policy around emissions. Every step of the process will be evaluated, based not only on the existing policy and legislation but on what has happened previously. We really want to learn about the process technologies that have gone before us, but we do not want to add any negative impact. We will not be allowed to add any negative impact.

Dr Eamon McKeogh (DEPOTEC Project):

It is worth noting that it is funded by an environmental programme, so among the key drivers for the research as funded by the EU are environmental issues and sustainability. The demonstration of that will be an important objective.

The Chairperson:

When will you finish the project?

Dr Bruton:

It is a three-year project. The first 12 months involve looking at the technology development and trying to understand that. As we said, 30 companies have tried this method previously in various forms, including pilots, and have failed.

The Chairperson:

That has been all over the world.

Dr McKeogh:

It is similar to any research project in that you start off by doing a literature review and a review of technology that has or has not worked properly. It requires a review of a whole range of technologies, and we have also decided that not only will we look at pyrolysis or the depolymerisation process but at other processes for comparative reasons. Technology will be sustainable in the long term only if it does not have any strong competition from elsewhere. We are looking at technology, financial viability and longer-term sustainability.

Dr Bruton:

Published studies state that the technology has failed in the past because of the overall economics of the process. The technology itself has been developing over a long period.

The Chairperson:

Obviously, there is a high infrastructural cost. A massive amount of heat is required for the process. Will the infrastructure be very costly?

Dr Bruton:

It is a €4 million project, of which we are getting €1·6 million from the EU, but we will undertake extensive energy modelling on how to reduce our overall energy cost, which is one of the key factors associated with the cost. Much of the infrastructure, including the shredders, is already out there and can be bought. We will develop the furnace and the technology with our Polish partners. The costs are extensive, but through every step of the process, we will try to reduce them.

The Chairperson:

Will the infrastructure be costly for the industry?

Dr McKeogh:

The long-term objective is that this will not be a sink for funds but rather a source, so that a profit can be made through the use of the appropriate technology and the energy efficiency recovery systems that go with it. That is one of my key roles in the project. We will look at energy balances, at energy in/energy out and at the most cost-effective way to provide that energy.

Mr Weir:

Thank you for your presentation. The layout of this room is like 'The Apprentice', but for a second, I thought that I had stumbled into 'Dragons' Den'. I hasten to add a disclaimer: I am not going to run for the presidency at any stage.

Mr Dallat:

That is comforting. *[Laughter.]*

Mr Weir:

Some people in the room are very relieved.

Although technology is improving, it has, broadly speaking, been out there for some time. From what you said, it seems that the barriers are trying to crack the issue of the economics that are tied in with the technology. You are at the very early stages, but do you have any thoughts about the broad economies of scale that would be required to make it work, or is that one of the areas that you will probe?

Dr Bruton:

It is one of the areas that we are probing. We need to understand what our security of supply looks like and where our supply will be located. Even getting the material to the plant has an impact on the energy cost, so —

Mr Weir:

It would also, presumably, involve the quantity of product that you are producing.

Dr Bruton:

Exactly.

Dr McKeogh:

Economy of scale is a key factor. That is where the sustainability issue comes in, because you need to know that you will get volume throughput for that scale. If there is any question about that, there is a question mark over the initial investment.

Mr Weir:

Perhaps I did not pick you up clearly enough at the start. Obviously, you have the university-driven side of it. What input do people in the industry have to the process?

Dr Bruton:

We are working with a mechanical engineering company called Erneside Engineering, which has been involved in renewable energy start-up facilities in the past. We will get a lot of its experience during the pilot phase.

Mr Weir:

It is about marrying the industry with the university or academic side of it.

Dr Bruton:

Exactly. We have a good balance between the industry and the academic side. We are looking for opportunities to talk to people and understand what other things will have an impact.

Mr Weir:

Will you remind us of the project's timescale?

Dr Bruton:

Our plan is that we will start the planning stage or the building of the pilot around the mid-point of the project. We are engaging with the environmental folks to try to understand what we need and what information they need so that we can start to put in place the pilot's planning processes. Our end goal is to demonstrate what the LIFE+ programme is all about.

Mr Dallat:

What does pyrolysis mean? I hope that I got the pronunciation of that word right.

Dr Bruton:

Pyrolysis?

Mr Dallat:

It is something like that.

Mr Hamilton:

It is like 'Countdown'.

Mr Dallat:

What is the difference between that and depolymerisation?

Dr Bruton:

In different places, pyrolysis and depolymerisation are used interchangeably. We are still looking at the technology and the specifics around it, so we are using depolymerisation. Our process is done with no oxygen — basically, with heat — to break down the tyre material to its constituent components. They can be used interchangeably; we use depolymerisation because we have not yet finalised the process.

Dr McKeogh:

You could say that depolymerisation is a broader term that could include other methods of breaking down the rubber.

Mr Dallat:

Other than heat?

Dr McKeogh:

Yes. Pyrolysis fits into the category of depolymerisation, but depolymerisation is broader.

Mr Dallat:

Is it really a spin-out company that you have set up? I am trying to marry the connection between academia and the world of manufacturing or whatever.

Dr Bruton:

You get a 50% contribution from LIFE+, and you have to find a 50% contribution from industry. That is where the whole industry and academia marry up. The prototype facility is not a commercial one; it is just a demonstration facility.

Mr Dallat:

The university is primarily to prepare students for the outside world.

Dr McKeogh:

That is 50% of its remit. The other 50% is research.

Mr Dallat:

I wanted to ask something else. It will come back to me, Chairperson.

Mr Hamilton:

I want to pick up on Peter's point about volumes. If the technology works, and you find the right method, you are going to need huge volumes to do what you are doing. Given the infrastructure and its construction, do you envisage that there is enough capacity or security of supply in Ireland to do that? Can it be adjusted by the scale of the geographical area? You get into problems of shipping stuff —

Dr Bruton:

The process can be scaled up. Right now, we are looking at the supply line in the Republic, but we are also looking at the entire supply line. It has a huge impact on the process; if we do not have a guaranteed supply line —

Dr McKeogh:

That is a key question for the project. The cut-off point for economies of scale will be a very valuable piece of information to come out of the project. We can then get into a discussion about whether, say for a country the size of Ireland or for an all-island supply from Ireland, that would be a single plant or three or four plants. Those are the unanswered questions at this stage. That is where the full life-cycle analysis comes in, because tyres have to be transported from one location to another. All of that will be taken into account in that type of analysis.

Mr Hamilton:

That is why I raised that point. There are certain obvious attractions in having one huge plant because that would cut down costs at one end but costs could be pushed up somewhere else.

Dr Bruton:

Exactly.

Mr Hamilton:

There is also the issue of environmental protection.

Mr Kinahan:

You indicated that polymerisation is the route that you are looking at. Are there alternatives that you are not looking at? Presumably, you chose that route because you think that it is best for the environment and for paying for itself. Are there alternative methods that we need to keep an eye on?

Dr Bruton:

There are various methods of depolymerisation that depend on the type of heat transfer or the type of furnace that is used. We are evaluating all those to figure out which one is best for us. Given the energy intensity of the process, we need to make sure that we optimise the process overall. During our life-cycle analysis, we will look at those options to ensure that the option that we pick makes sense. We also have to consider energy modelling.

Mr Kinahan:

So there is not another glaringly different way to treat tyres that we need to be aware of that does not involve burning, roasting or —

Dr McKeogh:

There are many other ways to treat tyres, but they are not glaringly different. However, we have to consider those as options and compare the overall performance according to the parameters that we have set for evaluation in the project.

Mr Kinahan:

I can see the costs being high at one end, and the transport —

Dr McKeogh:

There are no preconceived ideas. We have not gone down the depolymerisation or pyrolysis route because we feel that that is the best solution. We have to find out whether it is and show that it is, with hard facts. There is no bias here; we have an open mind.

Mr Dallat:

I remember the question that I wanted to ask. Cadbury established a chocolate factory in Poland because it claimed that people's taste buds are the same. However, I cannot make the connection between tyres and Poland. Why a Polish partner?

Dr Bruton:

We did some extensive investigations last year when we were looking at submitting our proposal. We were working with the European Tyre Recycling Association, and we came across our Polish partner, which had already been doing work in that area. It was already involved in the ETRA. I came across the company on the Web, and we met them.

Mr Dallat:

There is no sinister reason for asking. That is a perfectly good explanation.

The Chairperson:

Do the regulations state that you must have a partner from a member state?

Dr Bruton:

Yes.

The Chairperson:

It is also good for sharing knowledge and experience.

I want to ask Dr Kurz a question. Are you from the Environmental Protection Agency (EPA)?

Dr Kurz:

Yes.

The Chairperson:

We do not have such an agency yet. Hopefully, we will get one at some stage.

Dr Kurz:

I am really here just to listen.

The Chairperson:

OK. *[Laughter.]*

Mr Hamilton:

Good answer.

The Chairperson:

I will ask a question. If you can answer it, please go ahead and do so. If not, we understand.

Mr Hamilton:

That is the problem with an environmental protection agency, Anna; it is not accountable to anyone.

The Chairperson:

Good shot, Simon. We have difficulty defining end of waste — what is an end-of-waste product and what is still seen as waste. Recycling companies say that the bales of tyres that they export to other countries to use for energy or whatever should be seen as products. Do you have a definition or criteria for waste and end product that you tell industry?

Dr Kurz:

The Environmental Protection Agency is, as far as I understand, the competent authority to make that decision. I believe that the office of climate, licensing and resource use takes decisions on end of waste. Decisions on whether a facility needs a waste permit, certificate of registration, a waste licence or nothing at all are made in accordance with article 11 of the Waste Management (Facility Permit and Registration) Regulations 2007. Does that make sense?

The Chairperson:

Say that again. Right: if a facility produces crumbs, that is seen as a product. However, if it has tyres baled and sent out of the country for other countries to use as fuel, that is still regarded as waste not product? Is that correct?

Dr Kurz:

That decision is taken by the Environmental Protection Agency on a case-by-case basis.

The Chairperson:

Right. OK. That is probably even more confusing.

Mr Conyngham:

May I add something? There is some definition in the legislation. I believe that, at present, there is actually an amendment on bales. The Government want to define literally how long something can be considered to be —

The Chairperson:

A product.

Mr Conyngham:

Yes. They want to define the X number of months that an item could sit on the ground if it is to be recycled. I believe that that is the proposed amendment. However, there are some fears on a Europe-wide basis. They do not want to give any legitimacy to a bale of tyres. They say that it is waste, full stop: you have just packaged it up into a square and have not really moved it on. The argument in favour is that there was a scenario in which — I believe that it is still used in some places — it was put in foundations for roads and building —

The Chairperson:

Roads and bridges.

Mr Conyngham:

That was an argument for allowing it to be there for a period of time. However, a mountain of baled tyres is hugely different to a mountain of tyres that are in a pile on the ground. I believe that that is the amendment that is proposed to the definition. Although there is some definition, you are correct; there is an interpretation at any point.

We talked about retreaded truck tyres. We regularly transport tyre carcasses that are not retreaded. We have never been stopped. However, there may come a day when somebody stops one of our trucks. We can prove quite easily with documentation that those carcasses are in the process of being retreaded. There are some grey areas in which we rely on a judgement being made at a certain point with the existing legislation.

Mr Niall Murray (Tractamotors Ltd):

There are competing agencies. Under legislation in the Republic of Ireland, you are allowed to transport two tons of waste that is incidental to your business. In the case of someone who looks after a fleet of trucks and is, perhaps, transporting tyres that were removed from the fleet at the trucking company's yard, the question is whether they are waste and you are allowed to carry them or whether they are a raw material that will subsequently be turned into remoulded tyres. That argument goes on all the time. Legislation has tried to cover the industry for the incidental transport of two tons of waste. Obviously, the waste industry says that it does not want tyre companies getting into the waste business without a licence and without the proper legislation to govern all their actions. There is still a huge argument to be made to the EPA, and we are still making the case to the EPA as to what constitutes tyre waste. It has not really been defined.

The Chairperson:

That is similar to our situation up North.

Dr Kurz:

I work in the waste data team. However, a section in the EPA, the office of climate, licensing and resource use in Wexford, routinely deals with that. It is not my area.

The Chairperson:

I understand that. Sorry for putting you on the spot.

Dr Kurz:

That is OK. That office has all the procedures, and they are the people to talk to.

The Chairperson:

Thank you; we can find out from them. Thank you for attempting to answer. You did a good job.

Are there any other questions?

Mr Kinahan:

My question relates to something that I asked Colm about previously when we discussed the effect of the border, North and South. I asked what effect the Scottish border had and what the UK is doing and how that relates to what we are trying to do with tyres. I felt that his answer should be recorded.

Mr Conyngham:

If trucks can move — if anything can move — it is better to have a similar scenario for waste recording and waste disposal throughout the regions. In an ideal world, the entire UK, in my opinion, should have a similar system to ours in Southern Ireland. I know that some tyre companies and organisations in the UK have had that discussion. However, I am not part of that so I do not know their complete opinions. Nevertheless, we have put that point forward, and I know that they have considered the various options. That could then be extended from the UK to France.

Mr Murray:

A good thing to remember, Colm, is that, from a manufacturing point of view, a lot of companies in the Republic of Ireland have regional headquarters in England. Therefore, any of the people dealing with companies in the UK would be dealing with the same people.

Mr Kinahan:

So they should be able to —

Mr Murray:

The Irish Tyre Industry Association meets the corresponding associations in England at least once or twice a year. We are a kind of family. Colm, like me, goes back and forth to England to meet the various people whom we represent. They have exactly the same problem over there. It is a self-regulating system. As the news reports on cowboy warehouses filled with tyres and fields being abandoned to tyres, it brings the whole waste tyre issue to the fore. It is obviously a challenge to the industry as to how it will fulfil —

Mr Conyngham:

Does the Scottish Parliament have control over the issue?

Mr Hamilton:

I imagine it must.

The Chairperson:

Yes.

Mr Conyngham:

It would certainly be a starting point. It is geographically easier to get there by ferry.

The Chairperson:

However, it is more likely that people in the North would go fly-tipping to Donegal — across the border to the other side — or vice versa.

Mr Conyngham:

In an ideal world, it would be good to have the same system across boundaries.

Mr Kinahan:

They have it in Scotland.

The Chairperson:

Dumping in Scotland does not happen that often. It is very expensive.

Mr Weir:

Deposited waste normally goes in the opposite direction. Work is ongoing to try to deal with

that.

Mr Conyngham:

I thank the Northern Ireland Assembly for bringing this to our attention. It is marvellous to hear that it is happening in Ireland. From the point of view of the type companies, the barrier over the years has been the economic side and the price of the commodity. However, in your favour — you are probably aware of this — the price of the commodities has risen steadily over the past two or three years. That is certainly bringing it to a point at which waste tyres could become a commodity and have real value. That could solve all our problems overnight. That will ultimately reduce, and almost remove, any need for the policing of tyres because they will have an intrinsic value. It is quite possible that that will happen in the not-too-distant future, because of the way in which commodity prices are going around the world and with there being a finite amount of oil. I see a good future for that if you can solve this problem.

With regard to the economics of undertaking the operation in Ireland, you will be hampered by the amount of tyres that you can feed in. However, it should be possible on the island of Ireland to have one plant at least, if not a couple of competing plants. The real opportunity for commercial exploitation would be to license that technology globally; if someone came up with technology that no one else had, licensed it globally and had those plants at various points around the world, it would be a huge opportunity. For that to come from this part of the world would be marvellous.

The Chairperson:

You said that other countries had tried it. Do they have a patent? Are you just going to refine it, or are you going to do something totally new?

Dr Bruton:

Our Polish partner is developing the process for the DEPOTEC project with our input. The hope is that we will patent our own technology.

Dr McKeogh:

There is no doubt that IP will be derived from the project. The scope for IP development is there.

The Chairperson:

I am sorry — what is "IP"?

Dr McKeogh:

Intellectual property: it has been high on the agenda in the initial part of the project. There has been discussion among the partners about who gets a share of the IP. Patents should emerge. There is some background IP, and IP will develop as the project progresses.

As you say, you could enter into licensing arrangements internationally. The world really is the market for this if you can prove that something works at a reasonable scale. We will do a pilot scale, which is in the order of 500 to 1,000 tons a year. There is then the next step up, at which it is tested in our economic modelling systems to show the appropriate scale at which to operate as well as the margins and the profitability. That is what I hope we get from it.

The Chairperson:

There are so many countries that can adopt it. Even in China, there are so many more cars, and therefore tyres, than there were 10 years ago.

Dr McKeogh:

There is the whole question of environmental legislation, implementation and enforcement. The technology, such as pyrolysis and rotary kiln technology, is relatively old and goes back to the 1970s. That technology has been operated without any due regard for the environment, so there are serious environmental issues associated with it. It is about the whole clean-up operation when it comes to the refinement of the technology, and energy recovery, so that you are looking at the complete balance, the overall energy balance, emissions, and so forth. That will be a very important aspect.

The Chairperson:

That will be a new aspect.

Dr McKeogh:

The implementation will be Europe-wide initially, which means that there will not be the same problems with permits, and so forth. If you have specified what the end products will be, you have specified the whole process, and full documentation of the entire process has been created.

That is the essence.

The Chairperson:

The best of luck with the research. We look forward to hearing about great success from it.

Dr McKeogh:

May I ask why you invited us to join your meeting? I know that you are interested. Have you any specific plan to follow a line of research in this area because we would be very interested in collaborating with any programme that you have?

The Chairperson:

We are the Committee for the Environment of the Northern Ireland Assembly. We are conducting an inquiry into the disposal of used tyres. We have some two million new tyres coming in and old tyres being disposed of. At the moment, we do not really have a system to record how they are disposed of and who is doing what. Obviously, there is also illegal dumping, with people hiring barns and just leaving thousands of tyres and walking away or fly-tipping into bogs and burying them, which incurs huge costs for local councils or farmers to dispose of them. There is also a huge environmental impact on the fields. We are looking into mapping it out and making recommendations on how the Department of the Environment should address the problem. We hope to produce a report by March 2012.

Mr Dallat:

I enthusiastically supported the plan because I believed that we were visiting Cork, which is a beautiful city. *[Laughter.]*

Mr Weir:

Perhaps there will be enough for Hansard to record.

The Chairperson:

We are very interested in looking at new ways to dispose of this waste. We should not call it waste if is going to be of great use as a resource.

Dr McKeogh:

It is a resource.

The Chairperson:

Yes, it is a resource.

Dr McKeogh:

If you change the mindset.

The Chairperson:

As Colm said, if it is going to be profitable, it will be another industry helping the economy and creating jobs. More and more people will then want to dispose of tyres legitimately rather than illegally.

Dr McKeogh:

Although we have a technology focus, we also have a business focus. So one has to look at the complete picture, which includes the supply line. That is where your concerns are relevant, and we would welcome any information that you have and which you think would be interesting for us. We hope that we keep up the communication.

The Chairperson:

Equally, we would be very interested to hear of progress in your project.

Dr McKeogh:

Perhaps we will invite you to Cork. *[Laughter.]*

The Chairperson:

Thank you very much for coming all the way from Cork to meet us. We would love to have gone down to see your project site. We could come down when you have made further progress. Thank you very much.