OFFICIAL REPORT
AITHISG OIFIGEIL

Rural Affairs, Islands and Natural Environment Committee

Wednesday 8 December 2021

Session 6

The Scottish Parliament
Pàrlamaid na h-Alba

Wednesday 8 December 2021

CONTENTS

RURAL AFFAIRS, ISLANDS AND NATURAL ENVIRONMENT COMMITTEE
14th Meeting 2021, Session 6

CONVENER

*Finlay Carson (Galloway and West Dumfries) (Con)

DEPUTY CONVENER

*Beatrice Wishart (Shetland Islands) (LD)

COMMITTEE MEMBERS

*Karen Adam (Banffshire and Buchan Coast) (SNP)
*Dr Alasdair Allan (Na h-Eileanan an Iar) (SNP)
*Ariane Burgess (Highlands and Islands) (Green)
*Jim Fairlie (Perthshire South and Kinross-shire) (SNP)
*Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con)
*Jenni Minto (Argyll and Bute) (SNP)
*Mercedes Villalba (North East Scotland) (Lab)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Ian Dickie (Economics for the Environment Consultancy)
Professor Sir Dieter Helm (University of Oxford)
Eilidh Mactaggart (Scottish National Investment Bank)
Jo Pike (Scottish Wildlife Trust)
Dr Pat Snowdon (Scottish Forestry)

CLERK TO THE COMMITTEE

Emma Johnston

LOCATION

The Mary Fairfax Somerville Room (CR2)

Scottish Parliament

Rural Affairs, Islands and Natural Environment Committee

Wednesday 8 December 2021

[The Convener opened the meeting at 09:00]

Climate and Nature Emergencies

The Convener (Finlay Carson): Good morning, and welcome to the 14th meeting in session 6 of the Rural Affairs, Islands and Natural Environment Committee. I remind members who are using electronic devices to turn those to silent.

Our first item of business is an evidence session on the role of funding and finance in the climate and nature emergencies, particularly in relation to the rural economy. I am delighted to welcome our first witness, Professor Sir Dieter Helm, professor of economic policy at the University of Oxford. We very much appreciate your finding time in your busy schedule to join us. We have until 10.30 for this session.

I will kick off with the first question. We have previously heard your views on natural capital. Exactly what is meant by the terms "natural capital" and "public goods", and how can natural assets be properly accounted for and embedded into our economies?

Professor Sir Dieter Helm (University of Oxford): The natural capital—in this case, of Scotland—is the assets that nature bequeaths us, and will go on bequeathing us, for free, not just for the next generation but for all generations to come. That distinguishes it from normal industry capital and from human capital. They are assets in perpetuity that have a special, open-ended value that extends into the far distant future. The objective in environmental terms is to ensure that that set of assets is maintained so that current and future generations have the same opportunity to exploit them.

Some of those assets are non-renewable. North Sea oil and gas are a classic example. If one generation uses the asset, some compensation is needed for future generations so that they benefit from that natural bequeathment for ever. However, the really important ones are the renewable natural capitals; Scotland has abundant such assets.

Public goods are framed within that. A public good is not something that is just in the public interest; it is a good that has a particular set of characteristics. It is non-excludable and non-rivalrous: if you have benefited from it, so can I; and I cannot stop you from enjoying it and you cannot stop me from enjoying it. In that way, a public good is distinguishable from normal market goods, which are always excludable. If I go to the supermarket and buy something and eat it, you cannot; if the supermarket sells it to me, it cannot sell it to someone else. Those are simple distinctions, but they make a great deal of difference in thinking about what Governments should do and what private markets could do if they were appropriately regulated and organised.

The Convener: Over the past few weeks, the damage that has been done by storms has been very clear. Thousands of hectares of trees have been flattened. Some argue that those trees have been planted in the wrong place—for example, on good farmland.

How should we properly account for natural capital, given that we are seeing what is potentially a bit of a land grab, in that, in order to do a bit of greenwashing, big commercial companies are buying land, some of which is of very high value in terms of agricultural production, and planting trees? Do we need to rapidly have a baseline and look again at how we classify land to ensure that some of our best agricultural land is not turned into forestry? Is that part of what we need to do to assess our natural capital?

Professor Sir Dieter Helm: If I were Scottish, I would be worrying greatly about what is going on in the land market in Scotland at the moment and about the narrow silo approach to Scotland's natural environment that comes from an exclusive focus on the 26th UN climate change conference of the parties—COP26.

I am, of course, deeply concerned about carbon. Carbon matters a great deal, and the opportunities to sequestrate carbon in Scotland are potentially enormous. However, almost every sequestration—planting trees, for example—has impacts on other natural capitals at the same time, and land has competing uses. If we put all the eggs in the carbon basket and ignore the other natural capitals, we will end up planting the wrong trees in the wrong places and potentially do that natural capital as a whole a lot of damage.

There are competing uses for land between food production, bio crops, tree planting and so on. There always have been. The way to sort those things out is to make sure that the markets all work on a level playing field. If we look at land use in the United Kingdom as a whole, and in Scotland, we see an enormously distorted agriculture sector and what I call the crazy economics of farming, which does not lead to farmers doing the right things in the right place. It leads to them doing what they are incentivised to do under the common agricultural policy and post-CAP. That is also part and parcel of the mix.

It is a hard ask, but we have to get right the carbon bit, the agriculture bit, the biodiversity bit and the water bit. I will understand it if you say that that is all very complicated. It is, but if you do not take all the natural capitals into account at the same time in making decisions, you could end up with some disastrous results. Recall that it was once thought that Scotland was a good place to plant large numbers of coniferous forests for timber. There was a deep and significant market in timber and timber was needed. However, if you focus on timber and nothing else, as was done for a lot of the 20th century, you end up with some extremely inappropriate types of trees planted in the wrong places and a lot of environmental damage.

There is no way around the fact that you have to look at each and all of the dimensions of land use, and not just once. Otherwise, you will end up with a land grab. I am not close to developments in Scotland, but the tendency for financial institutions to buy big blocks of land to sell on as offsets, some of which might be quite sensible, seems to me to be a dangerous possibility. It may well become a fait accompli. It will be done before anyone thinks about the consequences, and you will be stuck with the land ownership that results and have to think about retrospective regulation.

I urge you to intervene now and think about what you want land ownership and land use to be in this carbon world before it is, as I say, a fait accompli.

The Convener: That is interesting. My next question is whether the horse has bolted. Targets have already been set for tree planting and peatland, and we are racing down that road. Some of our routes to reaching net zero by 2045 are already based on trees, which will generally be Sitka spruce. Is it still possible to put the brakes on and do the work that you are talking about to ensure that we get the right outcomes and do not have Sitka spruce planted on agricultural land that would be better put to other use? What methods should we employ? How can we get Government to slow down a bit and look at the long-term implications rather than grab the low-hanging fruit?

Professor Sir Dieter Helm: I do not have the privilege of being a politician and of having been elected to make such decisions. All that I can say from the outside is that it is pretty crude to say that you want to plant a number of trees by a certain date without any regard to where, what sort of trees, and some of the ancillary components of that. That does not mean that there is not a good case for planting a lot of trees, but it is a matter of having the right trees in the right place.

I urge that you start with a baseline of what you have and that you shine a torch on how the proposals for people to do things will change the ecosystems and the natural capital of Scotland so that at least what is going on can be seen. There is, of course, an element of experiment in that but, from the outside, we should look at the idea that all or most of the emphasis should be on planting spruces—assuming, of course, that the new disease does not wipe them out; there is another issue to do with robustness in woodland planting when a single-species approach is chosen—and see how that matches up against alternative and, dare I say it, cheaper ways of sequestrating carbon. When we look at the economics of a carbon offset from growing trees and think about the time horizon involved, we see that it is not obvious that that is the most straightforward approach.

Scotland has, on a global scale, peat of phenomenal interest and value in the carbon world and the biodiversity world. My guess is that the carbon, biodiversity and water gains from addressing peat as the priority would be greater than those from simply assuaging companies that cannot or will not reduce their emissions by giving them an offset in planting another spruce plantation.

Those considerations require sound and careful shining of the torch on what is going on and hypothesising different possibilities for Scotland's future landscape and land use. If it is just allowed to happen, we will see what happens and, once it has happened, we will work out whether it was a good idea. However, if you have a look at your timber and spruce plantations at the moment and consider what Frank Fraser Darling called the brown "wet desert" of lots of Scotland, you will realise that waiting and seeing and finding out what the consequence might be is not a very sound environmental policy.

Ariane Burgess (Highlands and Islands) (Green): I will go in a little on the tree piece. I like what you are saying about standing back and taking a look at what the priority really is, but I am also a member of a committee that has the word "housing" in its name, and I am curious about creating a future Scotland in which we can build our housing from the timber that is grown here. I know that that is currently not possible because the tree quality is not good enough and we have to use things such as cross-laminated timber. What do you think about that? Can we think about planting trees for future generations? That was done when Salisbury cathedral was being built; people planted trees for its beams to be replaced hundreds of years later. Can we think along those lines with trees?

Professor Sir Dieter Helm: There are at least two dimensions to the housing consideration. One is that it is a good idea to plant trees, particularly if they are the right kind of trees, next to people and

not next to power lines, which would mean that we would want power companies to trim the trees to ensure that they do not fall on the wire so that we can have some resilience against storms, for example. The point about natural capital is that it is for us. I often say that nature does not care; we care about nature. If we want the mental and physical health benefits and the air quality benefits that come from trees to accrue with the maximum advantage, we should put them next to people and have green cities and green belts around them. If trees are put in remote places, there will probably be no physical and mental benefits from them, because nobody will go to them. During the lockdowns, the profound point that trees have a very important function in the built environment came up with clarity.

Your second point was about what happens to the trees at the end of their life and how they can substitute for amazingly carbon-intensive stuff such as steel and concrete. For all the talk about greening steel and concrete, we should spend a couple of minutes looking at the economics of what that would cost, and then think about the amount of embedded carbon that is going into construction of buildings throughout the United Kingdom. Those are really big-ticket numbers.

09:15

In this world of buildings, thinking of low-carbon alternatives to steel and concrete is incredibly important. That comes back to what happens to the trees at the end of their lives. Lots of people are walking around thinking that we can grow some trees, we can have some bio crops and we can burn them at the end, and that is carbon neutral. It is not carbon neutral. Burning those trees at the end of their lives will put carbon back into the atmosphere whereas the whole point of sequestration is to bury it just like the oil and gas and coal were buried hundreds of millions of years ago.

Using timber in buildings is an attractive option because it seals up carbon. The alternative is to let the trees rot on the ground and let nature take some of the carbon back into the soil. Of course, you will lose quite a lot of carbon in the process, but you will get a huge amount of biodiversity benefits by leaving timber lying around.

However, be careful in this territory. If you plant a tree today, we are talking about locking the carbon up in timber in a quarter of a century or more, particularly if you plant some of the more biodiversity-rich trees even further out. The oak trees that you were referring to in the example of Salisbury cathedral will take 100 years or more to reach an outcome. With a private discount rate of 3, 4 or 5 per cent, the value today of something in 100 years in conventional accounting and business terms is approximately zero. If you want the house to be built tomorrow morning, cement and steel are available.

Yes, this a route and a long-term sustainable option. Yes, anyone who is planting timber and buying offsets should explain what will happen to the trees at the end of their lives. The scale of the opportunity is somewhat limited but, on the other hand, if the timber is imported, it is still locking up carbon but not in your territorial account. From a global warming point of view, it is great to use imported timber if you do not have any domestic timber.

We also need to think about kinds of buildings. Lots of people are putting up additional buildings in their gardens and so on to benefit from working from home and all sorts of other alternatives. Putting up timber-framed buildings in those contexts is a quick win as opposed to the longer-term win of constructing big buildings such as factories and so on from timber. That is, of course, perfectly doable, but it is further out on the horizon.

We should look hard at the building sector and its use of timber, and we should look extremely hard at what people propose to do with the trees for which they are selling offsets at the end of their life.

Dr Alasdair Allan (Na h-Eileanan an Iar) (SNP): I have a lot of sympathy with what you are saying about Sitka spruce and monocultures. How should Government juggle those competing imperatives of wanting to plant more trees, for all the right reasons, and avoiding the dangers of planting only trees that can deliver in the short term? How would you advise juggling those two competing things?

Professor Sir Dieter Helm: I mentioned Sitka spruce, and it has a particular role, but, if you really want to sequestrate carbon quickly, you might as well plant Scotland with eucalyptus trees. They grow very quickly and they sequestrate carbon very fast, or so I am told.

My point is very simple. Nobody in their right mind thinks that we should have an open-ended position or plant anything that you like as long as the numbers add up to the total in the Government's target for tree planting, and irrespective of location. Scotland has long experience of the debates about the flow country. Think what a carbon disaster it would have been to have allowed that to be covered in fast-growing timber. Think of the damage to the peat.

That tells you that you must have a land use plan. You cannot simply leave private landowners to decide where they are going to plant big plantations. You have to think. "Do not plant them on peat," is a simple and straightforward mantra

but, actually, there might be some circumstances in which you could plant them on peat. However, allowing landowners to decide to plant trees on peat is not exactly consistent with addressing the urgency of the climate change and carbon problems. In fact, it will make emissions worse.

You would know that in Scotland if you not only moved away from a territorial carbon production basis for measuring your carbon emissions but carefully measured the emissions from the peat, soils and land in Scotland. It is easy to measure the carbon that comes out of a power station; it is a lot harder to measure the carbon that comes out of a field when someone ploughs it up or to measure the exact carbon emissions from a peat bog. However, you should use the precautionary principle about peat, in particular, and soils more generally. You should—I say "you should" but you are the politicians and I am only someone from outside giving advice—think urgently about having some land use planning within which tree planting is set.

Dr Allan: You mentioned land ownership. You will be aware that the pattern of land ownership has been a continuing matter of debate in Scotland for the past couple of centuries. There are examples in some parts of Scotland of well-intentioned and benign individuals with their own ideas of what is good for the environment coming in and buying very large amounts of land. Is that pattern of land ownership entirely helpful in trying to achieve the kind of outcomes that you are talking about? Where do communities fit into that debate when, sometimes, they have little say over what a landowner does?

Professor Sir Dieter Helm: I am sensitive to how important land ownership is in Scotland as a deep political, social and economic issue. There are two ways of thinking about it in the environmental context. The first is to say that anyone can own anything and we do not mind if a small number of individuals own most of Scotland but, although they might own it, they do not control it. In other words, they cannot do what they like on their land because we have rules, regulations and land use planning that dictate what can be done in certain places.

That is what we do in planning normally—you cannot just build a house where you choose; you have to get planning permission—and it is widely accepted. People might get aggrieved about particular planning decisions, but nobody seriously thinks that we should allow a free-for-all for people to build wherever they like. However, we seem to think that people can have a free-for-all to do what they like to the natural capital assets, which are bequeathed not only to the current citizens of Scotland but to all future generations of citizens.

My starting point is that, if you are not prepared to interfere, you do not think that you should interfere or there are arguments against interfering in who can own what, you should at least separate the control of what they do with the land from its ownership. I am aware of huge controversies not only in Scotland but in England about what you can do. Whether you can hunt on your own land is a legal matter, at least in England. Remember, too, that we shape the incentives for landowners by the crazy economics of the subsidies of agriculture. Any Government should consider extremely carefully the environmental consequences of that.

I would go slightly further. I do not know any country in the world that does not have concerns about foreign ownership of very large tracts of land. Who can own what and where has been an issue in England since the Norman conquest. When people propose very large-scale change of land use over very large areas, it would be amazing if there were not social, cultural and environmental consequences that go beyond the interests of the particular landowner. I am sure that they understand that.

The fashion in Scotland for massive rewilding projects fits into that frame. You must be very careful about rewilding. It is a conservation technique. There is no such thing as the wild and there is no such thing as a universal idea that, if you abandon land, that will somehow be best for nature. I am afraid that there is no part of this planet that man has not interfered with. Contrary to how quite a lot of people see it, Scotland is a very managed landscape: the brown, wet desert of Scotland was created by deliberate acts of choice about how farming, sheep farming, the clearances and so on would operate.

The deer population is a choice. Rewilding projects, which might in particular circumstances be the best conservation strategy, nevertheless require huge amounts of intervention. Rewilding does not involve going around shooting deer—good conservation does, in certain circumstances.

We should be very careful about sorting out what is in the private interest of people who own large amounts of land and what is in the public interest. The choice is between whether you do that by land reform in the deep sense in which Scotland has tried to address the issue in the past or whether you do that by inserting what the public interest is and therefore have an element of control over how land is used, which is how it has been done historically. I am urging, particularly with regard to the discussion about planting forests versus peatland—that is just an example—that deciding what happens is not something that can be left purely to private owners.

The Convener: Thank you. We will now move on to the theme of public funding.

Ariane Burgess: I have a couple of questions. I really appreciate your earlier responses. I would like to hear about the role that public funding can play in addressing the climate and nature emergencies, including whether it is more effective when it stipulates what must be done or when it stipulates what outcomes must be achieved.

Professor Sir Dieter Helm: Let me address the first part of the question, and then we might come to outputs.

If you want to work out how to achieve a net zero target in Scotland by a particular date, and you want to achieve certain targets on biodiversity and so on, you must first stop doing perverse things. Before any public money comes into the frame, you need to look at the private incentives to establish the baseline to which public money and funds should be an addition to get stuff done, particularly in the public goods dimension.

Take the carbon position in Scotland. There is a territorial carbon-production target. If you achieve that, you will not stop causing climate change. I tried to point that out when I was involved in the Scottish Government's advisory group on economic recovery. You can close down Grangemouth and all the rest of the energy-intensive activities in Scotland, import the stuff instead and your territorial carbon production will go down. However, I think that most people—certainly in England—would say that, in achieving net zero, they want to ensure that they no longer cause climate change. You can do that only on a carbon-production basis. If you distort the market so that there is pressure on decarbonisation in Scotland but not on importers, you will give a pollution subsidy to people who export to Scotland. That is nonsense and will not help tackle climate change. However, if you really want to get to your targets as fast as possible, go round and close down those businesses. If you quickly close down Grangemouth and import all those petrochemicals instead, that would make quite a big dent in territorial carbon production. However, that would be terrible for climate change. That is not to say that you would not want to do things about emissions from Grangemouth, but that is a separate issue.

09:30

First, we should sort out what we are trying to achieve. Scotland has an opportunity, even within the overarching framework, to at least publish clear carbon consumption accounts, so that people can see where substitutions have been made.

When we look across Scotland at the sectors that can contribute to the reduction of carbon, we should think about agriculture, heating, transport and electricity and energy production. Agriculture is a big-ticket story in relation to the total properly measured territorial emissions in Scotland and to carbon consumption. Agriculture covers much of the land of Scotland and, as I said, a lot of it remains a brown, wet desert, as Frank Fraser Darling described it. Peat is particularly important, but there are lots of other dimensions, such as the management of the soils and so on. We should sort those things out.

The theoretical right answer is to have an appropriate carbon price applied to all sectors. I understand why people do not want to do that, but subsidising agriculture to pollute while taxing the energy sector in order to reduce emissions is a fairly crazy policy, but it is ubiquitous across most of Europe and especially in the United States.

We need to sort out the baseline. Once we have done that, we have to work out what the missing bits are that we want to do on top, rather than try to compensate for the damage that the wrong policies are doing to encourage people to produce more emissions than are needed for an efficient Scottish economy. That is where public goods come in. In my mind, the core to those are what I regard as infrastructures. The physical infrastructure includes the transport system, the energy transmission distribution systems, the water systems and especially the fibre networks. Those have very important public system characteristics, and it is very important that policy shapes those that are being put in place. We can make the taxpayer pay or we can make the customer pay, but those systems are for everybody; they are not marginal and discrete added bits.

There is also natural infrastructure, which includes the natural systems and capital assets that we have been talking about. Those are primary targets when we think about public funding, especially in relation to biodiversity, because it is very hard to turn biodiversity into anything other than a public issue. There are additional problems about how to measure biodiversity, what it means and what its component parts are, but a policy that protects biodiversity is usually a policy that protects and enhances natural systems. Even with things such as peat, there is no reason why a carbon price would not be an appropriate way of adding some funds to the frame in which such issues can be addressed.

Ariane Burgess: Thank you for that comprehensive answer. I am glad that the meeting is being recorded, because I will watch that bit again to absorb it all.

I am intrigued by your proposal that public budgets could be set for river catchment areas, with interested parties being able to bid for a portion of the budget in order to provide environmental outcomes. I am interested in whether you have other ideas for innovative approaches to distributing funding and in how such approaches would achieve greater environmental outcomes.

Professor Sir Dieter Helm: Let me take the point about river catchments. I am what some people regard as a hopeless pragmatist on such issues. I want to be roughly right rather than pretty much precisely wrong, which is where we are at the moment. I want to think about how public money might be used, the frame in which that is set and how that relates to the natural infrastructures of the economy and ecosystem.

South of the border—please always bear in mind that I have more experience south of the border than I do north of the border—one way of carving up a land mass such as the United Kingdom is by river catchments, for reasons of geology and geography. Scotland has some phenomenal river catchments, such as the Tay, the Spey and so on. River catchments involve water abstraction; water is part and parcel of our basic needs. They involve floods and flood defence and they involve a great deal of integrated nature, because they are corridors. Multiple parties are at play in any catchment, including forestry interests, water companies, flood defence organisations, nature organisations that are interested in its biodiversity, tourism organisations and whisky distillery organisations, which use the water.

What really worried me about the system that we designed for our river catchments south of the border is that the water companies are responsible for water and sewage but nothing else; the Environment Agency is responsible for flood defence but not for the provision of water; farmers are completely independent of those activities but are responsible for a great deal of pollution that goes into those rivers; and all sorts of local authorities and others have an interest in access, the use of nature and so on.

I had in mind that we should identify a system and have a regulator or operator for it, such as we have for the National Grid—that is a system in which there is an operator function. By the way, you should have those for your regional electricity companies, as well; that would lead to planning that is a lot better than in the situation that you have experienced in the south-east of Scotland, at least. The operator for the catchment should have a budget, which would include the public money that is already being spent in the catchment. It turns out that most of that is spent on agriculture. Much bigger gains could be made by reallocating the agriculture budgets to virtually anything else that could be done in most catchments. That would certainly be the case south of the border. The budget would also include the flood defence money. Some thought would have to be given to the components of the water bills that water customers are paying, especially where they are not metered.

A decision should then be made to produce a catchment plan in order to provide a view about what should happen to, for example, the Spey or the Thames. The catchment regulator, operator or planner should not start by saying, “I know the answer and I will impose it, Stalin-like, upon you.” It should say, “Right, let’s go through a process and ask people to imagine different possibilities for the catchment.” It should then do a baseline natural capital survey, involving digital data, to determine exactly what the baseline is. It should look at the ways in which the money could be spent and see which enhancements produce the greatest net benefits to the natural capital, all of which should be simultaneously taken into account. It should then ask the private sector to bid to do those things. Farmers could come forward and bid for funding to plant trees along the riverbank for certain benefits and at a certain cost. Water companies could bid in—perhaps negatively, as in some areas of the south of England—to pay farmers to keep cover crops in place, in order to stop the silt and the pollution going into the rivers. The flood defence people might decide not to build more concrete but to pay people to do certain things about land management further down the river. The central point is that the catchment has to be seen as an integrated system, rather than as a series of discrete bits, which is our current approach to water, agriculture and flood defence.

My guess is that—I am always sceptical about this phrase, but I think that it is appropriate—we could do a lot more for quite a lot less. Given that tackling the environmental challenges that we face, such as those around climate change and biodiversity, will not be cheap, as some environmentalists imagine, but will be really quite expensive, and that customers, voters, individuals, consumers and citizens are, in the end, going to pay in one way or another, it behoves us to use the public money that we have at the moment in a more efficient way.

The question then would be how much extra money should be allocated to those catchments for the public goods. A sensible way to go about that is to ask what the difference would be if that money were spent, for example, on the Spey and not on the Tay—what the project is, and what environmental benefits are going to come from those things. You could even imagine catchment

operators saying, “You know what, you should give us more money and them less.” We would then have contest and challenge, and we would really see what the benefits are.

Everything that I am saying in that regard is said in the relatively new context of our being able to create digital baselines—in considerable resolution detail—of exactly what is currently going on. We now have the opportunity to say not, “I like this, you like that” or “I think that this is better and that is worse,” but, “I will map exactly what it would look like in that catchment if we put a forest in this particular place.” That is a huge advantage that was not available five years ago and that is improving very quickly. In the future, digital mapping as part of land use planning and public money spending will be absolutely mainstream and normal.

Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con): Sir Dieter Helm might be interested to know that the Tweed Forum is doing a consultation on management of the Tweed catchment. The committee should possibly look at that.

I apologise for going back to some questions that might already have been asked, but I am interested in market-based mechanisms and the intervention of the Scottish Government through the £50 million of funding from the Scottish National Investment Bank that incentivises the use of natural assets.

What is your opinion on the risks that might be associated with carbon trading? In addition, although I think that you have answered this already, should we put our natural assets at the forefront as the priority, rather than the other way around?

Professor Sir Dieter Helm: Although I do not like the words “of course”, of course you should put the natural assets at the front. As I said, I only advise while you are privileged to make decisions. Nonetheless, I humbly put it to you that it is your duty to make sure that future generations inherit a decent Scotland in which to live their lives as they choose. If you do not look to the natural assets, you are—in effect—vulnerable to the possibility that you are trashing the future opportunities of future citizens, so, of course, you will look to the natural assets.

There is a lot of hype talked about market-based mechanisms; equally, there are a lot of criticisms that are not valid. No market exists in a laissez-faire wonderland. All markets are regulated. Capitalism developed because the state could powerfully guarantee property rights. Any market is highly regulated; that is particularly true of the ones that people think are most capitalist, such as stock exchanges and share trading. They set rules around who trades, where they trade, what they trade and what information they use. They are probably more regulated than virtually anything else that I can think of. When I ask my students what they think the most capitalist market is, they usually come up with those financial markets. It is therefore a nonsense to say that it is either the state or the market. To me, it would be a big stretch to imagine that the state taking over many of those functions that are currently market functions would be a great idea in order to hasten us towards net zero and protecting biodiversity.

The question is how we regulate markets appropriately and focus on what they can do well, as opposed to trying to get them to do things that are inherently not amenable to markets. In the carbon world—where most people have thought about this—on the emissions side, market mechanisms that are based on setting the carbon price are inherently sensible. The reason for that is that a tonne of carbon emitted anywhere is homogeneous; it is the same as any tonne of carbon emitted anywhere else. That is why, earlier, I emphasised carbon consumption and not carbon production. It does not matter whether the steel was made in China or—as it used to be—in Scotland; we are still just talking about carbon emissions. If you want to address global warming, you would ideally have a carbon price, which would lead the market to sort out the cheapest ways of reducing emissions. If we thought about it, peat would be a pretty good target for that, but power stations are so often in that frame.

09:45

The problems come with the sequestration side of the market mechanisms and with so-called carbon offsets. I understand that you can now “buy” a net zero liquefied natural gas tanker cargo sailing towards Milford Haven on the grounds that the relevant oil or gas company has planted a lot of trees in the United States. That is not what we mean by appropriate offsetting markets; it is an example of where, instead of doing sequestration and carbon emissions reduction, we think that it is perfectly suitable to do one or the other.

The second thing to say about offsets is that no two offsets on the ground are alike, unlike with emissions, which are the same wherever they happen. If you plant the trees on a bit of the flow country in Scotland, that is not the same thing as planting them on the banks of the River Tweed. There is therefore not the possibility of a clean, open, transparent, liquid-deep offsets market, which is quite contrary to what Carney and others have advocated. That could lead to some really difficult outcomes. It does not mean that people should not pay for the carbon offsets. Those would be an extraordinary revenue stream for our natural

environmental, and perhaps the biggest one on offer out there, but we cannot have people simply trading them on as though they are trading carbon emissions in a straightforward market way.

I suspect that many landowners would be rather worried if they did a deal with an environmental, social and governance-compliant company to help it with offsets and suddenly found that the offset was sold to ExxonMobil or Saudi Aramco or someone else by a financial institution. One therefore needs to think quite carefully about who are the trustees and guardians of those offsets and about how exactly the property rights around them are constrained by regulation. It is a detailed area, and I have thought a lot about how to do it, including setting up trust funds or investment trusts to put trustees in place over such areas, while also getting the revenues in.

We should also remember that, in the offset market, the fact that you do a deal with someone to plant a tree does not mean that you have sequestrated that carbon today. You need to know that it will be sequestrated in 25 years. You need to make sure that the capital maintenance is done. You need to keep the deer and the grey squirrels out. You need to know what happens at the end of that project's life. Again, that is completely different from buying a tonne of carbon emissions in respect of what was Longannet or something like that.

I am afraid that market design is the essence of how we regulate in order to ensure that the best profit-seeking private incentives deliver the public outcomes that we are interested in and not just the private benefits.

I am sorry—that was a bit of a convoluted answer, but the issue is not amenable to the simple propositions that were floated in, for example, Glasgow. It needs to be thought through, otherwise there could be some quite nasty unintended consequences.

Rachael Hamilton: I was tickled by a comment that made it to *The Scotsman,* in which you said that

"it wasn't enough for big corporations to greenwash themselves by purchasing carbon offset credits in the same manner as the nobility had purchased redemption from the church in mediaeval times."

That summarises what you have just said.

My next question is about how to get that public-private balance and equality of benefit for everybody. You talked about not just planting swathes of trees in the Highlands, but using the central belt as part of the conversation. How do we, with regulation, separate emissions reduction and carbon sequestration, and judge the success of both of those either separately or together?

Professor Sir Dieter Helm: We need both. That was the point of my reference to church indulgences. I perfectly understand environmentalists who look in horror at offsetting and say that we do not want it to be an excuse to carry on emissions—there is a lot of substance in that. Given the timetable for the net zero targets, we have to have bricks on the accelerators of emissions reductions and sequestration.

If we put a brick on the sequestration accelerator and manage the land properly, the benefits will be vastly beyond those of carbon reduction. Think about carbon in soil and what modern agriculture has done to our soils. I am not a scientist—I am an economist—but my understanding is that there are two interesting stylised facts about soils. The first is that soil has three to four times the carbon of the atmosphere. We have to let that sink in. It is our primary carbon sink on the planet. Scottish soils are thin in particular places, but the carbon density of the peat on North Uist is very high.

The second fact is that the carbon in the soils is a good proxy for the biodiversity in them. That links to a third observation, which is that most biodiversity is beneath our feet. We all think about biodiversity as being about letting beavers come back or having lynxes running around, for instance. I am not against those in the right circumstances, but they are trophy bits of biodiversity. They might be important for the control of deer—although I am sure that a rifle would be more effective—but that is the stuff on the top. What is in the soil is the basis of our system and our invertebrate life and what is constructed above it.

Multiple benefits come up on the sequestration side, and we need to focus hard on those.

Is it wrong to allow private sector companies to buy offsets? No. Would it be a good idea to turn down that revenue stream? I think that it would be a big mistake, now, not to have that private financial inflow coming in. However, I am concerned about how it comes in, what constitutes a proper offset and how it is managed. That is why I like the idea that, when people want to sell offsets, they should sell into a trust fund. Many people could invest in such trust funds.

Suppose that I am a reputable company, whatever that means—let us say that I am ESG compliant and doing all the right things—but I have some emissions that, although they stand up to inspection, are incredibly hard for me to deal with and I convince everyone, including the trust fund, that I have a good reason for investing in offsets. When I buy into that fund to get that offset, I might undertake never to sell my offset until I have achieved my net zero target, and to sell it on only

to someone else who is ESG compliant and has a proper net zero strategy and accounting.

There is a lot to be said for some companies, local authorities and public organisations being involved in so-called trading of carbon offsets, but trading only to companies that are acceptable and compliant and not allowing them simply to sell offsets on to ExxonMobil or whoever elsewhere. No criticism of ExxonMobil is intended in my comments; I simply make that point.

That brings us back to the earlier statement about market mechanisms. Regulation is of the essence. If you want a wild west of carbon offsets, do not expect Scotland's natural environment to be in a particularly good state. Expect a land grab and the plantation of the fastest growing trees that sequestrate carbon at the fastest possible rate, and do not worry about who ends up owning those things. You can do much better than that without ruling out bringing offsetting into the frame.

The Convener: I call Jenni Minto.

Jenni Minto (Argyll and Bute) (SNP): Thank you very much for your helpful and informative evidence, Sir Dieter.

I have a few more questions about the market mechanism. You have talked about the importance of regulating and intervening now before it becomes a fait accompli. At a fringe event that I attended at COP26, it was suggested that the market might be moving more quickly than regulation, legislation or Government, and I am interested to hear about the risks and opportunities for agriculture, fisheries and tenant as well as land farmers with regard to market-based mechanisms and private funding. How will those help us to achieve just transition?

Professor Sir Dieter Helm: You have packed a lot into your question, but I will do my best.

Farmers are best treated as businesses. They are profit maximising and are trying to get the maximum yield from their land. Of course, they care about the land but, like any other business, they have a discount rate.

In my experience, farmers probably respond to incentives almost better than any other sector that I know of. They are extremely good at working out what they are going to be paid for and how to get paid and changing their behaviour accordingly. If someone wants to pay them very large sums of money to produce biogases, you are going to have 1,000-acre Tayside farms completely turned over to growing rye grass and other materials for that purpose. However, that is one of the issues. You have to be very careful about creating an incentive to do X, because you then have a target within a particular frame—say, biofuels—without having thought through the other consequences that flow from the other incentives that farmers have.

Farmers are private businesses; they are not in the public good business per se, unless someone offers to pay them to deliver a public good. In looking at their land and planning for the future, they have to take into account not just the fact that they might be paid to manage carbon or that they might be regulated in what they do that impacts upon carbon, but the future of food production itself. I am much taken by the scale of the technological revolution that is taking place in farming; I am not quite at the level of thinking that it will all take place indoors, but if you look at the indoor vertical farming pilot at the James Hutton Institute, in Dundee, you will see where some of these things are going.

Farming will be in the frame for a massive digitalisation revolution, which will enable a farmer to know what is happening in fantastic detail down to almost the square metre. That is a complete revolution from the old model of a farmer who, having farmed an area for the whole of their life, would know almost through instinct but certainly through feel and knowledge exactly what was in each corner of a field. Now you can see things from a satellite. That is transformational.

Secondly, robotics is greatly changing the management of crops. You can see what is going to happen in Scotland's soft fruit industry, what with the enormous research that is being carried out on designing a robot to pick a raspberry. That is quite an interesting problem.

Thirdly, there is the genetic revolution. Genetics is not just about animals—there are all sorts of questions to be asked about all these technologies; it is also about plants and plant science.

It would be perfectly plausible that a farmer might need less land to produce their current output in future. The assumption that you need more land, just because the demand for food goes up, might have been true in the 20th century, but it is no longer true as we move forward. There are lots of other opportunities to be confronted. You could be a carbon farmer or a wildlife farmer; you could look at hedgerows, which are rather different in a lot of Scotland than they are in the south of England; and you could look at being paid to do certain things that impact less on the environment. Of course, you could look at the other side of that, as long as you realised that you would be much more heavily regulated—and, I hope, taxed—with regard to the pollution that farming causes to the environment.

10:00

To frame the issue, agriculture produces about 10 or 11 per cent of total emissions in the United Kingdom—that is without properly measuring the soil and peat emissions—for 0.5 per cent of gross domestic product. Agriculture is by far the largest relative polluter in carbon terms, whereas it should be a net sequestrator. The opportunities to change farming practice and produce better outcomes are enormous and greater than those in any other sector of the economy.

Over the next 25 years, farmers will face very different prices and incentives, and, as they have done historically, they will respond to the changes in technology and prices and think hard about how to use their land. It is the public duty to shape those incentives in a way that is at least a little less inefficient than they have been for the past 70 years. It is hard to think of a less appropriate set of incentives than the ones with which we have confronted farmers since the second world war.

Jenni Minto: I have seen the vertical farming that is being worked on in Invergowrie.

There is a possibility that tenant farmers could have their tenancy agreement cut and that they will not be able to get back into farming because of what landowners are looking to do with their land. What is your response to that?

Professor Sir Dieter Helm: At one level, the tenancy issue is a deep and particularly Scottish issue about ownership of land, landlordism and all those kinds of things. However, I will focus on the practicalities, of which there are two. First, if a tenant does not have security of tenure, it is unlikely that measures in relation to carbon sequestration will make economic sense to them, because the payback is usually beyond the length of the tenancy.

The way that security of tenure works under the crofting legislation and those kinds of things is absolutely crucial to the incentive structure. One thing that really worries me—I do not have any knowledge of how this works in Scotland, but I have observed it elsewhere—is that really big investment financial institutions will see that the value of the land is in buying it up and flogging off the carbon offsets from it, and in financialising that product. The problem is that, if you want to buy a big chunk of land and plant it with trees, you have to clear off the tenants. Of course, this is a hypothetical example, but, if I were a tenant farmer seeing some of the direction of travel in the offset world and what some of the financial institutions are bringing to the table, I would worry that my future as a tenant was close to zero.

That leads to a public issue about whether you want only land that is managed by people who have full ownership and control rights or whether you want the land partly tenanted with properly regulated land-use terms, so that particular individuals or financial institutions that buy up large chunks of Scotland cannot simply impose what might turn out to be a much more profitable route. At one time, landowners thought that sheep were more profitable than crofters, and I cannot help but see an analogy between that and the idea that trees might be much more profitable than small tenant farmers.

However, ultimately, it is for the Scottish Government to work out the property rights structure and whether crofters and tenants have sufficient security of tenure that they can participate in this future world and the changes that go with it. There is no reason why those changes should be any less good or bad than full ownership, but that issue needs to be sorted out. As I said, if we wait until the land grab has happened, it will be incredibly late to bring back tenants who have gone.

Jenni Minto: Great.

The Convener: I have a supplementary question. Traditionally, and at the moment, farmers are carbon farmers, nature farmers, food farmers, cultural farmers, soil farmers and tech farmers all at the same time—they have to have regard to all those matters. Some pay more regard to food production than to nature; for others, it is the other way round. In the future, will that broad spectrum of responsibilities be spread as they are now, with farmers taking responsibility, to varying degrees, for all aspects of land management, or will regional land use partnerships and so on specify areas that should focus on food production or on protecting crested newts, for example? How do you see everything coming together to deliver the biodiversity and climate change recovery that we need?

Professor Sir Dieter Helm: Farmers are the land managers. They are on the ground and make decisions on what they will do with the land, given the incentives that surround them. There is not a Stalinist planning framework in which we can go around telling farmers that they need to do X here and Y there and that they need to grow this crop here and that crop there. We had a bit of that after the second world war, but there are so many unintended consequences and there is so much balancing to be done that someone has to exercise discretion. That is what ownership does, but that should be within the framework of the incentives that are put in place. That is why we cannot get away from the idea that we have to take a broad view on land use management in Scotland. That does not mean that we should be prescriptive about particular bits, but that view should inform the incentives structure that is put in place.

I am minded to be against the idea that we can designate some areas for intensive food production and some areas for nature, which would be protected areas. We cannot say, "We have some special bits over here, but you can trash that bit there in the most intensive way you possibly can." That would be a kind of apartheid, which would be nonsense scientifically and nonsense from the point of view of the land more generally. In the end, if we continue down the path of intensifying agricultural production, we will trash the land. Again, it is a question of ensuring that such assets are available not just for this generation but for future generations.

I am just as interested in what happens in intensive potato-growing or barley-producing areas towards the east of Scotland as I am in what happens to Highland sheep management. One has to focus carefully on the incentives. If we put fertiliser on the land, which we will do for a very long time to come, that will have some unintended consequences. For example, the fertiliser will flow off into the rivers—in the summer, we can go down the Tweed and look at the algae—so we need to incentivise people to use less fertiliser. We also need to help farmers to use the technology to understand in detail the quality of the land, so that they can work out how to target pesticides and so on. I do not think that there should be an apartheid between food and nature; food is produced by nature, so such things should be thought of in parallel.

That does not mean that every bit of land has to be used in the same way—quite the contrary. It is not possible to grow a whole variety of crops on the west coast that can be grown on the east coast. However, in that process, one wants a set of incentives: the polluter-pays principle and the provision of support, through public goods, for research and development and some of the technical changes that are out there. That will ultimately create a different set of prices and returns for farmers, who can then use the discretion that is available to choose what to do.

I believe neither that farmers are natural altruists who will always do the best thing for nature nor that they are rapine capitalists who will do a lot of damage for short-term gain. They just respond like any other business to the incentives in front of them, the regulatory framework that is set and the subsidy regimes that are in place. To put it bluntly, it is your job as politicians to sort that out, and you will get the results according to how well that framework is put in place.

The Convener: For some time, the principle of public money for public goods has been suggested as the way forward south of the border. Some policies are now being introduced, but some people do not view them as a particularly good move. In Scotland, the direction of travel for rural support is still quite unclear, particularly in relation to the replacement for CAP. Is there anything in what is being introduced south of the border that should be adopted up here, and what should we avoid when it comes to future rural payments?

Professor Sir Dieter Helm: As with all these revolutions, you have a set of bold ambitions on what is to be done with agricultural policy, so it will not end up back with the status quo ex ante, but it will end up being much more evolutionary than what was put in place in the first instance by the advocates of the revolution.

The sustainable finance incentive is the big chunk of the new policy. It is not that different from pillar 1 of the CAP, and, if we look at the greening components, it is not that different from the European proposals for CAP changes. There is an idea that England is on a pedestal and that what it is doing is completely different from what everyone else is doing, but the reality is a lot more nuanced than that.

It is true that the big advance in England is in putting the concept of public money for public goods in the Agriculture Act 2020 and making it the abiding principle of what is happening. It is a bit like the "Dig for victory" slogan after the second world war: it is the motivating driver. It forces people to say why we should give them taxpayers' and citizens' money to do things and what the public benefit will be, as opposed to their private interest.

The worst possible way of running an agricultural subsidy system is to pay people to own land. What benefit is there to a citizen of Glasgow, Edinburgh or Stirling in knowing that somebody who buys X thousand acres of Scotland will be paid X pounds per hectare because they own it? It is just extraordinary. We know how we got there: previously, we paid them to produce output and they did exactly what was said on the tin—they produced the output, and we ended up with butter mountains, milk lakes and goodness knows what else. There were wine lakes, too, which I found much more interesting than milk lakes.

That is a crazy way of doing things, and it is one of the reasons why the price of land is so high in Scotland. If you buy an asset and I pay you £10 a hectare, you will capitalise that in the price, because I have given you an annuity of £10 an acre going forward. That excludes young farmers coming into the system, and it excludes lots of parties who might want to buy their tenancy. That is crazy, so we need to move away from that. Our worry in England is that we are not actually identifying the public good. Instead, we are saying, "I tell you what—we will send a consultant round and they will come up with a farm plan. If we like

the farm plan, we will give you a subsidy, and it may turn out to be similar to what you were receiving under the pillar 1 payment for owning land." That is crazy, but it is the essence of where it goes. The advantage that England has over Scotland, Wales and Northern Ireland is that, in the public domain, you are now forced to explain why exactly money is being given to a farmer and what exactly the public good that we get from it is.

10:15

Last week, on Radio 4's "Farming Today" programme, I heard the Secretary of State for Environment, Food and Rural Affairs say, "I don't know why farmers are whinging it's not enough money. They're going to get paid for quite a lot of things they are going to do anyway." What is the point of using public money to pay people to do things that they would do anyway? Could I have a public subsidy, please, because I am going to walk to the train station although I would have walked to it anyway? That is not what public money is for.

That is an example of taxpayers' money—public funds—not, in the ordinary course of events, getting the benefits that it could. If you have a net zero target of the form that you have in Scotland and really have the biodiversity targets that you have in mind, you do not have the luxury of wasting money in ways that will not build towards those targets.

Achieving those targets will be expensive, so consumers and taxpayers will have to pick up the tab for it. I put it to you that every penny that is available advances you toward your targets. It is not perverse and it is not wasted. The advantage of having the term "public money for public goods", which I put a huge effort into pushing, is that it at least frames the discussion and enables citizens to ask questions of agriculture that, in the past, they might not have asked. Perhaps it would have been okay in the past, but it is not okay with the climate and biodiversity targets that we now have.

Jim Fairlie (Perthshire South and Kinross-shire) (SNP): Dieter, you are a fantastic witness. I have been engrossed in everything that you have said, but, if I was still farming, I would be thinking, "Oh my God, I hope he doesn't develop the policy or we're not going to get a penny." I might be completely misrepresenting what you say.

I would like to raise a couple of points with you. Another thing that I have got out of the conversation is that we can talk in silos and it sounds great until we start to bring in the unintended consequences. You have given us so much to think about. I have thoroughly enjoyed your evidence.

Correct me if I am wrong, but food costs us in subsidy from the public purse, in land degradation and environmental damage or in the consumer paying for it from their purse when they buy it in the shops. The current subsidy system was introduced after the second world war. About 30 per cent of household income used to go on food, but now it is about 8.5 per cent. Therefore, it could be argued that the public value of the subsidy is the fact that food is cheap. However, the counter to that is that we can buy much cheaper food from Australia or America, for instance, and the question is whether the price of the subsidy out of the consumers' pockets will still be met by bringing in cheap food from elsewhere. That is a short statement but it is a huge question. How do we square that?

Professor Sir Dieter Helm: I will unpack those questions and preface that with a remark. It is sometimes said that I am an academic commenting on such matters. My family were all farmers or in horticulture, so I have grown up with some understanding of the practicalities that face people who have to do the work on the front line. I hope that I am a hopeless pragmatist and not just trying to think through principles.

If I were a farmer looking forward, I struggle to think that I would believe that the system that we have will be sustained for much longer anyway. Most farmers can see what has happened, and they have responded to the incentives in front of them. At the moment, I am working on a project at Chichester harbour in the south of England; in 10 years' time, it will be biologically dead, and half the pollution involved comes off farmland. No one can imagine that such a position is sustainable. The situation is different in different circumstances.

When, as a farmer, I look at my farm, should I say, "Gosh, this is awful. I'm going to be asked to do all this stuff and my business model and profits are going to collapse," or should I look at it as a cornucopia of opportunities to do farming better and to increase my productivity and, indeed, profits? When I look out the window, I can see the technology coming. Farming productivity has had an appalling record over the past 10, 20 or 30 years, and the technologies bring great opportunities to do the job better. My personal view is that technical change will dwarf everything else that we have been talking about from a farming business model perspective. Not every farm will be run by a maths graduate—preferably from Oxford rather than Cambridge—but it will be a much more high-tech job in the bigger farming areas.

We just need to look at the huge market in carbon. If I were a farmer, I would now have an opportunity to benefit from sequestration practices. Yes, I would have to reduce my emissions and yes, things such as red diesel are indefensible substitutes for diesel in a world in which we are

trying to decarbonise, but all sorts of other technologies—including hydrogen—are coming along in the farming sector.

As for what I should grow as a farmer, if we had proper carbon border prices, if we had carbon consumption, not carbon production, as the target and if we paid at the border—that is, at the docks—for destroying the rainforest in the Amazon in order to grow beef that competes in the market with Scottish beef, I would see my market getting bigger, not smaller. All the agricultural trade that you are talking about has potentially very big carbon components. It is an extremely important issue. I would not want to be faced with a variety of environment costs while the guys in Brazil who clear the rainforest for cattle just pick up my market. That is not acceptable.

The situation with sheep is different. It is not true that New Zealand sheep, once delivered to the UK, are necessarily more carbon intensive than sheep produced in the uplands of parts of the UK. Things are different in different cases, but a carbon border adjustment and proper carbon pricing will give British—and, indeed, Scottish—farmers a much better frame. There was some discussion of carbon border adjustments in Glasgow; the European Union is pushing ahead with them, and we should do the same.

Finally, it is a complete myth that the common agricultural policy produces cheap food. In fact, it has customs barriers all around it to keep the price of food up in the EU and to protect it from particular kinds of imports—although I should say that the carbon border adjustment mechanism is an aside to that. The price of food is very influenced by policy, and the cost of food production to the farmer in the UK is influenced by the amount of capital involved in the farm, which will include the farmland price. If land prices go up in Scotland, the rate of return goes down for any crop that is sold.

If I were a farmer in Scotland, I would find all this unnerving, because the world would be changing underneath me. Of course, I would have found joining the EU pretty unnerving, too. However, the cornucopia of opportunities that I have mentioned raises the possibility of having a really thriving agricultural sector and is not the threat to people's livelihoods that some less informed lobbyists try to present it as.

Jim Fairlie: I am aware of the time, convener, so I will leave my questions there.

The Convener: We are running out of time, so we will move to final questions from Beatrice Wishart.

Beatrice Wishart (Shetland Islands) (LD): I thank Professor Helm for this morning's fascinating and informative session. I have two questions that are slightly different, but I will ask them in the hope that he has time to respond.

We have talked about competing needs and carbon sequestration and offset. How can the circle be squared regarding natural capital and renewable energy—for example, in relation to building wind farms on peatland, which may or may not be degraded?

Will you also say a bit more about fiscal measures such as taxes and levies that can be used to respond to the climate emergency?

Professor Sir Dieter Helm: Neither of those questions is easy. However, the second one at least has a straightforward answer, which is that we need a price on carbon. We will not get to net zero unless we have a carbon price, which should be the same in all sectors of the economy. We should start low and do that very gradually, because it takes time for people to adapt. However, if not having a carbon price is precisely the wrong answer, almost any incremental carbon price is roughly right and better. How that works and whether that feeds through into the price of fertiliser, pesticides and all sorts of other things is important.

In the end, it is carbon that we are trying to deal with, and therefore it is carbon that we should price. Polluters should pay, and an efficient economy is one where the pollution costs are internalised in the economy. Not to have a carbon border price is to distort the economy as well as trade.

The wind farms versus peat bogs question is complex. In theory, both have value, and the wind farm, if it were to go on to a peat bog, should have to pay for all the carbon emitted from the peat bog as a result of its activities. My guess is that that would rule out virtually any wind farm on a peat bog. In practice, the peat is so precious and such a global asset that the contribution of individual wind turbines to global warming is not sufficient to offset the value of those peat bogs.

We should remember that wind is a disaggregated, decentralised and very low-energy intensive way of generating electricity. That is not to say that we should not do it or that it is not desirable to have wind. However, given the amount of land in Scotland and the amount of coastal waters around the United Kingdom, if our efforts in relation to climate change end up with us covering peat bogs with wind farms, we might as well admit defeat now and give up. That would be a tragedy of an outcome with no net benefit in relation to global warming and the concentration of carbon in the atmosphere that we should be addressing. Before we do that, we should therefore think hard.

We should also remember that, when we put a wind farm on fragile soils, we create roads. If you fly over the top of any established wind farm, you can see all the chalk exposed. I recently looked at the wind farms in Croatia, for example. Once those roads are there, people will use them, and they will reveal the surface of delicate soils. My argument is therefore that we should be careful. There are so many sites that we could use and, if I may make a plea, it would be that we leave the peat alone—or at least try to improve it rather than simply expose more of it. That would be world leadership as well as good for Scotland.

Karen Adam (Banffshire and Buchan Coast) (SNP): I thank Sir Dieter Helm for his comprehensive answers. I have found it absolutely fascinating, and my question has shifted every time he has given an answer. I will come in to mop up or sweep up, so to speak.

Although I have many questions, throughout it all, I have sensed a very top-down approach. We talk about the private sector and the public sector, and we also talk about the people managing the land. We are in a sensitive time for the environment. We talk a lot about the green economy and—to take you out to sea for a bit, as I have a coastal community constituency—the blue economy. We also have a wellbeing economy and a good food nation and all that combined to be thinking of.

You spoke about politicians making the decisions. Before I became an MSP, I was a councillor, and I saw a lot of good localised community action, particularly when there was storm damage such as we had recently and during Covid-19. We have spoken about public ownership for public good, but what about local ownership for local good? Farmers and fishermen see the changes in our environment before anybody else, and they might know the best way to manage those things. What are your views on taking a very localised view and on local ownership?

10:30

Professor Sir Dieter Helm: We cannot avoid some top-down stuff. Net zero is a top-down target, so it is unavoidable. We have to decide where we are going—that is why we have Parliaments and Governments. However, none of it will be delivered without the citizens doing the stuff. With due respect to all of you round the table, you yourselves are not going to do much to change the natural environment of Scotland; your constituents will do that.

In my little book on net zero, I suggest that it would be a good idea to encourage all citizens to write their personal carbon diary. It does not have to be with an eye to precision, but everyone should simply sit down for one or two days, write down all the things that they do, have a guess about how much carbon is involved, and work out roughly what it would mean in 2040 or 2050 to write that carbon diary with no carbon in it. They should think about, for example, their breakfast cereal, the water in the loo, their travel to work, clothes, shoes, flights, all their electronic goods and power consumption and so on.

Ultimately, it is us citizens who buy the stuff and us citizens—not companies—who are the polluters, and we have to change our ways. That is not to say that we have to have hair shirts and all that stuff that our Prime Minister is keen on, but it is us who will be on the receiving end of all this, and we have to rewrite that carbon diary. If we do that as communities, from the bottom up, we can make a huge amount of change. Villages can plant their own community woodlands and have the kids involved in backyard biodiversity, and communities can buy out big landed estates.

There are a huge number of ways in which we can make the changes in all the multiple dimensions of how we, as citizens, participate in society. You, in Scotland, are a long way ahead on that. For example, you have had community buyout schemes, although I suspect that some have worked better than others. I have looked at a few in the Outer Hebrides, where I have walked around and seen what people are doing with those opportunities.

The community thing is crucial. However, when we have community buyouts, we have to work out how continuity will work. Most community projects that I have seen have immense enthusiasm from people to get them going. However, that is the easy bit; it is about what happens 10, 15 or 20 years down the track. That relates to the point that I made about trusts owning the carbon offsets and so on. It is about the form and regulation of those trusts—it is about the way in which they are set up and drive those frameworks so that individuals can not only create initiatives but make them happen. Of course, local government is crucial in that frame.

I do not want to come over as a top-down Stalinist—I am not. There are top-down things that have to be done but, in the end, Karen Adam's question is absolutely apposite. The bottom-up community and citizens line is important. We should remember that we are the people who will have to pay, the people who will have to vote for the people who will force us to pay, and the people who will, ultimately, have to change our ways. It is us—not some committee—who will drive the electric car rather than the petrol car. I am therefore very sympathetic to the question.

The Convener: That brings us to the end of the session. I thank Professor Sir Dieter Helm for his thought-provoking answers and for giving us his valuable time. His contribution is very much appreciated. I am pleased that we ended on that optimistic call for action.

We will suspend the meeting to allow for a changeover of panellists.

10:34

Meeting suspended.

10:45

On resuming—

The Convener: I welcome our second panel of witnesses, who are Ian Dickie, the director of the Economics for the Environment Consultancy; Eilidh Mactaggart, the chief executive of the Scottish National Investment Bank; Jo Pike, the chief executive of the Scottish Wildlife Trust; and Dr Pat Snowdon, the head of economics and woodland carbon code with Scottish Forestry.

Again, we have approximately 90 minutes for this evidence session. I will kick off the questions. To what extent has the overall conventional economic thinking changed in relation to the climate and nature emergencies? How does the concept of natural capital now play a part in your thinking about the way forward? What opportunities does it bring for the rural sector?

Ian Dickie (Economics for the Environment Consultancy): In the past five to 10 years, conventional economics thinking has become much more aware of environmental economics thinking, in which EFTEC specialises. That thinking is now being applied in the way that rural economies and the environment are managed. The natural capital framework is very relevant, particularly at a larger scale and in the national Government's thinking. It is the right framework to think about the long-term management of assets.

In the previous evidence session, Professor Helm talked about managing soil as an asset. That is what natural capital thinking helps you to do. It is not necessarily the right framework to communicate policy at a local level, but the principles of natural capital should be part of the thinking. Applying those things brings lots of new opportunities as well as risks, which were discussed in the previous session.

Eilidh Mactaggart (Scottish National Investment Bank): In the past 10 years, we have seen a massive shift in investment practices across the world. That has accelerated considerably in the past few years, which is a real benefit to the rural economy and investment in natural capital. There is a focus on the ESG principles and the positive impacts of investing as well as on profit from investing. The issues are becoming ever more prominent, and investors are demanding that twin impact along with the income generated from investment.

We have seen that a lot in forestry, and there is a lot to come in peatland regeneration and other natural capital investments. Positive steps towards that are coming through with the changes and the increased awareness of climate change. Ultimately, when people look to net zero and offsetting, that is a real opportunity to increase investment in natural capital.

The Convener: Before I move on to Jo Pike, from the Scottish Wildlife Trust, and Dr Snowdon, I ask them also to consider the comments that Dieter Helm made about the need to get the approach to natural capital right and to assess and baseline it. For example, we need to ensure that we do not plant tens of thousands of hectares of Sitka spruce if, in the long term, that is not the best investment. Potentially, we need to do all the planning before we bring forward policies. Do we need to pause right now, even though we are in a climate emergency, and ensure that we make the best investment for the long term to get the best from our natural capital?

Jo Pike (Scottish Wildlife Trust): The urgency of the situation suggests that we probably should not just press the pause button. However, there are mechanisms and processes in place that we can continue to drive forward and that will bring together the range of voices that are needed to help to avoid the unintended consequences that Dieter Helm talked about. For example, regional land use partnerships are an important potential mechanism for embedding the principles of natural capital. As Ian Dickie said, you would not necessarily use the language of natural capital to engage the wider public, but it is an important fundamental concept. Those partnerships are already happening, and they need support to make them work. There is no advocacy of a pause there.

We hear discussions about baselining in relation to the future of agricultural payments, and there is a huge imperative to move forward in that area. It is about making sure that we have an inclusive discussion and that those voices can help to surface the risks of unintended consequences in order to help to avoid them.

The Convener: You talk about not pausing, but we are already seeing extortionate prices for agricultural land that would normally be passed on to the next generation of farmers or new entrants—it is being snapped up for planting. We have also heard about wind farms potentially being put on peatland. You say that we should not

pause, but do we need to do more work to ensure that we do not go too far down the road and then have 25,000 hectares of inappropriate planting of Sitka spruce and so on? Maybe "pause" is not the right word, but do we need to go back and ensure that we are doing the right thing?

Dr Snowdon, we often hear the phrase "the right tree in the right place". How is Scottish Forestry ensuring that we are doing far more than that and looking at the long-term consequences of actions that we take now?

Dr Pat Snowdon (Scottish Forestry): Forestry is a long-term business, and, at the planning stage, it is normal practice to set out plans for the future. The document "The right tree in the right place: Planning for forestry & woodlands" is intended to take a strategic approach in order to guide local authorities. Forestry and Land Scotland, which owns the state forests in Scotland, plans its woodlands many decades ahead. Those things are all intended to ensure resilience and balance in a network of woodlands in the long term. There are a lot of checks and balances in the system at the moment.

Professor Helm referred to what happened in the flow country in the 1980s, but a lot has changed in forestry since then. We have the UK forestry standard, which is applied to all projects that we fund and which looks right across the range of benefits that woodlands provide.

On the first question, I totally agree that thinking about natural capital is a fundamental change in how economists look at nature, which is a really good thing. It is about mainstreaming nature into economic thinking, which is needed if the economy is to work for nature and not against it.

Dr Allan: As I hope you heard, we had an interesting contribution from Professor Helm, and I will unashamedly pick up on some of the themes that he raised. My first question is for Eilidh Mactaggart. What do you make of the ideas about a green economy and viewing capital and the natural environment in a different way? I am asking not whether they are right or wrong—there is a growing consensus about that—but how we make those ideas real in the eyes of investors, agriculture, Government and everyone else. What is the next step in ensuring that the ideas take hold?

Eilidh Mactaggart: The important thing is that we need private sector investment, as well as public sector investment, to achieve the aims. Sometimes, private sector investment gets a lot of criticism. Having come from that sector in my recent past, before I joined the bank a year and a half ago, I know that a lot of private sector capital wants to do purposeful impact investing and get more than just money from its investments—it wants the social impacts and, potentially, offsets. The opportunity is real. We need clever thinking about what that investment looks like and how to balance a financial return with positive impacts for the environment and for the local area.

Forestry has done a good job of that. Obviously, as the previous speaker said, in the 1980s and 1990s, the planting was very different from what it is now, but that shows the evolution and the learning journey. We will have that journey as we look into peatland restoration and other uses of land. Typically, it is about making sure that the use of land is appropriate. When we look into that, it is about whether the land is arable, suitable for sheep rearing or, because it cannot be used for anything else, more appropriate for tree planting.

I am sure that the forestry teams are already doing a lot of work with local authorities to identify the right use for the land and the right return of natural capital, tying that all in together with carbon credits, trading and offset, which the previous panel discussed. That is a real opportunity not just for forestry but for peatland regeneration and other uses of natural capital. In some instances, a single farm could have wind turbines and lease revenue from that, as well as forestry, which will provide sustainable building materials in the future. We have to start planting now to ensure that we have those sustainable materials in the future, alongside traditional farming, such as rearing cattle and crops. That is mixed use on an individual farm basis, which most of the big farms are very much across and looking to maximise.

From an investment perspective, it is about aggregating and making sure that the investment propositions are sufficiently large, because a lot of the capital that comes in is from big institutional investors such as pension funds and institutional annuity investors, who are typically looking at a certain scale of investment. Rather than £1 million, they are looking to invest £50 million, £60 million, £100 million or, sometimes, £250 million in a project. It is about bringing them together and capturing that bigger investment opportunity in order to access those large pots of capital.

Dr Allan: Thank you. When I asked Professor Sir Dieter Helm about land ownership, his interesting reply was that the fact that somebody owns something does not mean that they should not be constrained in what they do with it. I am not asking you to comment on the big political issues of land ownership, but I am curious to know about the Scottish National Investment Bank's attitude when it invests in rural Scotland and whether it would have that advice in mind about ensuring that there was monitoring and on-going contact with landowners to see how investment was carried out.

Eilidh Mactaggart: [*Inaudible.*]—contact with landowners, but it is also in contact with other bits of the public sector. We recently came across an investment opportunity in which there was an element of concern around peat, so I directed my team to get in touch with NatureScot to check what it thought. We also regularly contact the Scottish Environment Protection Agency and our forestry colleagues to ensure that the bank's investments do not cut across those larger objectives around what the land should be used for, because cutting across those ambitions would not be a good use of our capital.

Dr Allan: Thank you. I have a final question for Jo Pike. Again, it is based on the interesting conversations that we have had with Professor Sir Dieter Helm about the concept of rewilding. How do you understand that, and where do communities fit in when we are handling that concept?

Jo Pike: At the heart of the discussion about rewilding is the restoration of natural processes in order that our natural environment can recover and support communities to be more resilient, support our wellbeing and, ultimately, underpin our economy. It is really important that we do not pit the economy against nature, because the economy is embedded in nature. The rewilding story inspires huge numbers of people but also puts fear into large numbers of people, so it is really important that we have that discussion inclusively. The language matters less than the aim to restore nature and ensure that nature recovers—for the benefit of the people of Scotland and our economy—because it is not an option not to do that.

The Convener: Thank you. Jim Fairlie has a supplementary question.

Jim Fairlie: My question is about Eilidh Mactaggart's role in relation to what is going to be funded.

Dieter Helm talked about the possibility of investments in land in Scotland being handled by a trust fund that would have environmental concerns and sequestration as prerequisites for the initiatives that received funding. Do you see the Scottish National Investment Bank as the vehicle for that, so that any private funds that come into land in Scotland come through you and are then distributed via that one-stop shop in order to achieve the environmental aims, rather than there being what he described as a wild west free-for-all?

11:00

Eilidh Mactaggart: I think that we have a part to play in that, and we are already in conversation with public sector partners such as NatureScot about funds concerning natural capital. A great amount of work was done on that before the bank came into being, a year and a bit ago.

Although, as I said, we have a part to play, the grand idea is not that we would funnel all the money. We have some public capital and we absolutely have the ambition to use that to raise and crowd in private capital to deliver the ambitions of the bank, including the one that we are addressing today, which is primarily around being net zero but also involves natural capital, the environment and communities—our place mission touches on all those topics.

With regard to what has been said about the wild west approach, it is important to recognise that private capital has an important part to play, and issues that are dealt with at a policy level, such as those around designated land use, the requirements that are placed on landowners and so on, which were asked about earlier, can help to control some of that investment and ensure that we do not end up with a wild west situation whereby, for example, perfectly good arable land is used for tree planting.

We have to recognise that public capital is not enough to deliver our aims and that we also need private capital, which means that we have to ensure that the propositions are attractive enough to bring in private capital. The majority of private capital that comes in is backed up by pension funds, annuity plans or life insurance policy money, so a lot of that institutional capital ultimately ends up in a pensioner's pocket—it is being invested to ensure that the pension company can pay out the pension when it needs to do so, which means that you need to deliver that commercial return for that investment to be interesting to those investors.

As I mentioned in my first answer, in the past 10 years, I have seen a great deal of advancement in terms of that purposeful investment or impact investment. Many investors are looking to do more with their money than protect that pension investment—they also want to generate environmental and social benefits with their investments. We need to try to capture that and maximise it in terms of investment in Scotland. The bank has an important part to play in that and I would like to lead on some of the initial funds that are set up in that regard.

With regard to future funds, one of the things that the bank has been set up to do is lead the way into an investment proposition, establish it, normalise it and then let private capital step in at that point. That is a well-trodden path for development banks—we come in at the earlier, higher-risk stages and then move on to the next thing once the situation has normalised.

Ariane Burgess: I want to continue on that theme, but I will direct my questions to Jo Pike and Ian Dickie. What are your thoughts on how public funding can help to mobilise sources of private funding and whether there are good opportunities for that within the rural economy?

Jo Pike: Thank you for that really important question. From all the conversations that we have had with a wide range of stakeholders over the past few years, particularly during the Scottish conservation finance project, which brought together different parties, including an expert finance group, people with an interest in nature conservation, people with an interest in enterprise and so on, it is clear that Government can play a critically important role in the early stages of developing that kind of embryonic new way of looking at how we can close the finance gap to ensure that we set nature on the road to recovery. The ability of Government to provide a range of support for investment readiness funding is important.

South of the border, DEFRA, Natural England and others have run an investment readiness fund. That has provided much-needed support and has enabled innovation, and Scotland can take on board lessons that can be learned from it. One of the important lessons that we are learning is that more support is needed at an earlier stage of the process. Members have already heard this morning that we need to scale up but, in order for that to happen, we need investment readiness support in Scotland for the early stage conversations that will help to start building a pipeline. Obviously, there are huge opportunities and imperatives in terms of reforming subsidies in the agricultural space. Those two issues are not necessarily mutually exclusive.

Ian Dickie: I agree with that. Public money can help to ensure the delivery of public goods and the maintenance of standards through those investments.

On the investment readiness side, I would say that that can help to support some new governance structures that might be needed to ensure that investments happen in the interests of local communities.

It was interesting that the community buyout process was mentioned in your discussion with Professor Helm, because, effectively, that process allowed a new governance structure. If the investments that we are seeking come from institutions that are external to Scotland and the returns go back out of Scotland, that is not a desirable approach, and it is not in the best interests of local communities. However, often there is not an organisation that is able to represent the interests of all communities in the investment process. I have been involved in some green investment plans in England with people who are looking to create an institution that can represent community interests in how investments are made and can be in receipt of some of the profits of that investment. Good investors will welcome such a party that represents local community interests, because it will be involved in the investment for the long term, and the existence of such a party will help them to procure the long-term management of their investments.

Ariane Burgess: Thank you.

I want to ask Eilidh Mactaggart about the direction of the Scottish National Investment Bank. One of its three missions is to achieve

"a Just Transition to net zero carbon emissions by 2045"

and to

"Invest in rebalancing our economy towards leadership in sustainable technology, services and industries."

We have heard this morning that agriculture should be a key sector for investment, given the need for a just transition for farmers and innovative new technologies and practices. Is the SNIB—I do not know whether it is correct to call the bank that—currently supporting agricultural projects, or does it have plans to do so in the future?

Eilidh Mactaggart: We are just a year and a bit old—we had our first birthday just over a week ago—and we have already got 10 investments out in the investment universe, which is fantastic. We are considering a number of agriculture-linked investments that are in the pipeline—we have looked at vertical farming, different ways of approaching fish farming, and so on. We are also considering some supply chain projects that would shorten the carbon footprint of food through work on provenance. I know that the previous panel spoke about the carbon footprint of food—I caught a little bit about whether New Zealand lamb has a lower carbon footprint than Scottish lamb and so on. People around the world have to get their head around such issues, and a lot of thought is being put into how we can identify the carbon footprint of an individual item on the supermarket shelves.

Agriculture is an important part of the Scottish economy, and we are seeing a lot of opportunities for investment in it. That is encouraging, although nothing is closed at this point. I am confident that, by this time next year, I will be able to tell you that we have made some investments in that space. Just give us a little bit of time to get a little bit further on our journey.

Ariane Burgess: Thank you very much for that response.

I have a final question, which I will direct first to Pat Snowdon; I would like Eilidh Mactaggart to

come in afterwards. The committee will soon have the opportunity to scrutinise the budget bill and consider how it will impact on our rural sectors. What should we look out for on climate and nature in scrutinising the current draft budget and future budgets?

Dr Snowdon: Scottish Forestry has a strategy that looks at the sector going forward and that has an implementation plan that sets out various elements on which we aim to deliver. We measure progress against a number of indicators, which include fairly obvious ones such as carbon sequestration, but there are also biodiversity, community and economic objectives.

Forestry is quite a far-reaching activity in terms of what it delivers, and I recommend that you look across the different indicators that we measure to see the progress that we have made against them. You should also consider the plans going forward, because some things take time. With trees, we must wait for them to grow before they deliver. Some of the actions that we have already taken will deliver benefits in the future. That is particularly the case in looking at carbon.

Eilidh Mactaggart: On the issue of budgets and public investment, the Scottish National Investment Bank has been set up slightly differently from some of the policy teams and the enterprise and development agencies that Scotland has had for a long time. When we in development banks invest, we very much expect to get our money back. The bank has been set up to get our money back, recycle the capital and create, we hope, a perpetual fund for Scotland that is similar to some of the sovereign wealth funds that you might see in other countries. That ambition is built into the bank's DNA. We are looking for a return on our investments, to get our capital back, and to get impacts that will support the missions, one of which Ariane Burgess has already touched on.

On public sector budgeting and what the bank can do, the conversations that we need to have—we are already having them with policy teams, and they will develop—are about what needs grant funding and what needs one-way public investment versus what a development bank or the private sector can fund. That is really about identifying commercially investable propositions and putting commercial investment into them, and whether the bank leading on that and bringing in additional private capital is ideal. That leaves a smaller pot of things that need grant funding, start-up funding or other support that is more one way in nature. It is about making sure that we are putting the right money into the right projects.

If a commercial return is available and there are additional environmental or net zero impacts, for example, we capture that and put in the right money, rather than use budget that could be better spent elsewhere. We are very conscious that we must work closely with the policy teams on that.

Jim Fairlie: We have got the big ideas, the big visions and all the rest of it, but there is concern that market-based mechanisms such as carbon credits are fuelling the attractiveness of purchasing land for carbon offsetting. That potentially brings risks to local communities and other land users. On 30 September, the Scottish Parliament held a members' business debate on community wealth and the emergence of green lairds, in which the impact of carbon markets on land and land ownership was discussed.

My question is for Eilidh Mactaggart and then for Pat Snowdon. How can we avoid greenwashing by major companies coming into Scotland and buying up natural capital without any great benefit to the people who live here?

Eilidh Mactaggart: We touched on that a little bit earlier when we talked about the designation of land. Green belts have been in existence for decades as protected swathes of land around cities so that we do not have constant urban sprawl. Therefore, there are ways to protect and designate land, and to work with investors to use the right land for the right thing. That is about intelligent use of land. As was touched on earlier, forestry, for example, is looking to use alternative land that is not suitable for crops—

11:15

Jim Fairlie: I am sorry, Eilidh, but can I—

Eilidh Mactaggart: So, I think that there is—

Jim Fairlie: Eilidh—

Eilidh Mactaggart: —something that can be done there.

The Convener: I am sorry, but Jim Fairlie wants to intervene.

Jim Fairlie: I will interrupt you on that point.

Eilidh Mactaggart: Sure.

Jim Fairlie: Given what you have just said, do you believe that we should have land grades as the prerequisite for what will be planted? Are you suggesting that good-quality arable land should not be used for tree planting? Are you seeking specific grading of land for specific investments?

Eilidh Mactaggart: That might be above my pay grade as chief executive of the bank. There are policy teams that would perhaps be better versed in answering on that sort of designation. In considering investing in forestry, we look at the type of land that those involved are looking for. As an investor, it would not necessarily make sense to plant trees on arable land.

On how the Government wants to manage the land and work with landowners to use the land most appropriately, Government policy—and regulation, if it is needed—can drive that. I mentioned green belts. That form of regulation has been around for decades. I am not prescribing what might be needed myself, because there are many other people who could better advise on what that could look like, but that is an issue that investors take into account.

Most investors are very conscious of what their money does. There has been a lot of debate about greenwashing, and most of the big institutional investors are very conscious of trying not to do that. Some people will do that, and there is no perfect solution there.

We need to consider whether there are other ways in which we can use rewilding and peatland regeneration to create carbon offsets and trading and really get the benefit out of regenerating our peat and offsetting carbon versus cannibalising farmland or other tracts of land.

A number of areas interact in managing the issue. We need to work with private landowners to ensure that the best thing happens for the country as a whole.

One of the other witnesses mentioned community benefit funds, investments and trusts. Those are all fantastic ways to ensure that the community benefits from some of the investment. Typically, some of the larger private sector investors welcome that community connection with their investment—we see that in some of the green energy work that has already happened in the country.

Jim Fairlie: That goes back to my earlier point to you. Dieter Helm mentioned having a type of trust fund organisation that makes such investment decisions. You said that you do not have the expertise to deal with that—I get that—but that raises the question of what we are trying to achieve. We want to achieve net zero and a return for investors, and we want to be able to keep people on the land. It seems to me that there needs to be a mechanism for us to bring all that together.

That is just a statement; it is not a question for you, Eilidh.

The Convener: I will come in on the back of that with a question for Eilidh. I know that you said that the matter is above your pay grade or whatever, but should the National Investment Bank be looking at ethical decision making? There might, for example, be an economic argument for cutting down rainforests in Brazil and creating cattle lots. In the same way, and in the long term, should the bank be looking at investments in forestry planting? There is, absolutely, private sector money to be invested in that, but, in Scotland right now, land is overpriced and farmers are being priced out of the market because of the astronomical amounts that those private investors are willing to pay to plant trees. Jim Fairlie touched on land grades. Land classified as 3.2, which would normally be for agricultural production, is now assumed to be suitable for planting trees. Is that not something that you should consider when deciding on the investments that you might make? I put that question first to Eilidh and then to Ian Dickie.

Eilidh Mactaggart: We take a huge number of factors into account when considering our investments. For all development banks, including ours—and I should point out that we were set up under the EU state-aid rules, and we had to have those permissions in place before we could launch last year, although obviously the situation has changed with the post-Brexit subsidy control changes—a fundamental aim is not to invest in areas where the private sector is investing, because that is not a good use of your money.

For example, the Gresham House forestry fund in which we have recently invested is a different type of forestry fund. In recent years, forestry funds have been later-life forestry investment focused on harvesting, while the Gresham House fund is focused on planting and woodland creation. It was struggling to raise money from the private sector, because it had a longer horizon for the return on investment, and it was a new type of forestry investment that had never been made before. When the people involved approached us, we said, “Have you spoken to the private sector? There’s a lot of investment available for forestry,” and they told us, “No, because we’re looking to plant trees, and there’s a longer horizon for that sort of investment than for our previous investments.” We did a lot of work with them to ensure that our capital was required to establish and cornerstone the fund, and, now that we have done so, the fund has become increasingly attractive to other investors. That is a key role played by development banks everywhere; indeed, that is what the European Investment Bank and a number of other development banks in Europe and across the world do, and we are following that model with those investments.

We are very careful about how we invest in land grades. Some of the designations that you have mentioned are essentially forms of land use regulation. As for the pricing of agricultural land versus planting land, I do not know the economics of that off the top of my head, but I can say that the fund in which we have invested looks at land that typically will not be used for other forms of agriculture. In other words, it is the lower-quality land that is more suited to forestry. That was an

issue that we discussed in detail with the fund at the time of the investment.

The Convener: Perhaps Ian Dickie might like to comment.

Ian Dickie: The questions reveal quite an interesting problem about the information that is available on which to make such decisions. As has been pointed out, if investments are made only for the purpose of carbon markets or sequestration, that sort of land use will not be in Scotland's wider interests. Similarly, if such decisions are based on agricultural land grades, you will ignore certain environmental issues that might mean that your decision is not the right one.

What you need to do is join up the information, as we did in the Tweed study that is referred to in the meeting papers. We combined a series of rich data sets that were already in place but which had not been integrated or linked to socioeconomic information. Various purposes are being talked about, such as continuing agricultural production, new carbon markets and green investments, net positives for biodiversity and maintaining a community interest, but, if you have different sets of information for those and other issues and they are not interconnected, it will be very hard to make decisions that result in the best combined purpose for Scotland. It is possible to join up the data and have that sort of economic activity as a result. In other words, you can recognise the agricultural production value, the tourism value and the value to local communities with regard to, for example, public health.

The Convener: That was very useful.

Rachael Hamilton: I wonder whether Pat Snowdon can tell us how reductions in emissions can be measured through the woodland carbon code.

Dr Snowdon: That is the fundamental thing that it does. Estimates are based on tree growth models that our research agency, Forest Research, has been developing since the 1960s. The models were expanded to cover the whole biomass of the tree in order to estimate the carbon content for different species, different yield classes and under different management regimes. Indeed, the same carbon models are used in the UK's greenhouse gas inventory.

At the same time, we take account of emissions from soil, depending on how the trees have been planted and the type of soil in which they have been planted and the models account for any emissions from planting activity, such as harvesting. It is a comprehensive carbon model that looks at not only sequestration, but any emissions associated with forestry activities. Projects can put into the model their plans for planting woodland, including the species and yield classes involved, and it will provide estimates in five-year intervals for the amount of net carbon sequestration for that particular project. The model, which is available on our website, is used by all projects that are being established.

Rachael Hamilton: Are private investors put off by the fact that it takes a lot longer for them to make a return on investments in hardwood plantings such as oaks and beeches than in, say, Sitka spruce?

Dr Snowdon: Species such as Sitka spruce grow more quickly and are well suited to this country's climatic conditions, so, from a commercial perspective, the timeline is in many cases more attractive. The hardwood market is not as developed; there are opportunities that people are trying to take advantage of, but softwood has been the dominant investment model in the commercial sector.

Rachael Hamilton: In that case, would you recommend that corporates or companies that are looking to offset carbon but that are not actually reducing emissions be encouraged to invest in hardwood instead of Sitka spruce and to look very much at reducing their emissions on top of any carbon offsetting that they might be doing?

Dr Snowdon: As we say on the front page of our website, companies should follow an emissions mitigation hierarchy. They should reduce emissions first of all, and offsetting should be the last thing that they do. The woodland carbon code provides confidence that, when they get to the offsetting stage, it is done in the right way. We have based the code itself on international standards, such as the Gold Standard and Verra, which are the world's two leading standards. However, the code does not make any specific recommendations to companies about softwood or hardwood production.

One important point that I would make about timber production under the code is that it significantly reduces the number of carbon credits that can be claimed. Broadly speaking, with a commercial woodland, you can claim only about a third of the number of credits that you can claim with a woodland that is left there permanently. There is a trade-off here, because when you harvest trees, you take carbon out of the woodland. That will, to some extent, deter commercial investment in woodland carbon code woodlands, and it explains why the majority of projects—roughly three quarters—that have been validated under the woodland carbon code to date are mixed broadleaf or generally mixed woodlands.

Rachael Hamilton: I will turn to Eilidh MacTaggart. As we know, Government intervention incentivises natural assets and drives

up the value of carbon pricing, and that has created a gold rush of people buying land to offset carbon credits. How does the Scottish National Investment Bank measure the value to the public taxpayer of reducing emissions and sequestrating carbon?

Eilidh Mactaggart: That is a good question, because the issue of the value of investment versus carbon reduction is something that impact investors have been looking to quantify for a long time now. As I said, we look at the designated use of the land. We have an ethical investment policy, and we have very detailed discussions on such matters in our first-stage investment committee process before we make any investment to ensure that our capital is going to be deployed in the most responsible manner.

11:30

It is a growing field of investment, and we need to be careful that we take advantage of it in Scotland, because that money is needed to regenerate peat, to rewild, to ensure that we have sustainable building materials in the future and to ensure that the country hits net zero. It comes back to the right land being used for the right purpose, which has been a theme of the discussion. Whenever we make investments, we speak with the policy teams in the Scottish Government and, sometimes, in the UK Government to ensure that the investments will not cut across any policies or cause issues. We are live to such issues by having those regular discussions and by interacting regularly with politicians such as yourselves.

I cannot give one single solution to the question, other than to say that we are very aware and conscious of what our investment does. The investment should primarily deliver our missions; that is why the bank was set up. As a development bank, we can invest where others do not invest, and we can encourage such investment in the future. It is a very tricky space to manage.

I will pick up on the point about reducing first. Reducing emissions takes time, so it is important to provide investors with opportunities to offset while they are reducing their emissions and while the country and the rest of the world move away from a dependency on oil and gas. That provides an opportunity for us in Scotland to gather investment in order to help us to do that as a country.

There is no single solution. Earlier, Mr Fairlie talked about the need to look at the issue in the round when making any investment. That is why we work very closely with the policy teams.

Rachael Hamilton: The SNIB's aim is to sustain 200 jobs and to create 500 additional jobs. Do you know how many jobs have been created so far through the £50 million investment?

Eilidh Mactaggart: I do not, but I can follow up on that with the committee. The figure is changing daily. The £50 million has not been fully invested yet; it will be drawn on over time as land is purchased and investments are made. The figure of 200 jobs is a total over that time, but I can provide the committee with the answer to date following the meeting. It is very early days, because the fund has just been set up, but we are working towards that.

Jenni Minto: I thank the witnesses for joining us this morning. During COP26, I attended a couple of fringe events, one of which was on the global strategy to protect, restore and enhance biodiversity. I will direct my questions to Jo Pike, because I am interested in the Scottish Wildlife Trust's funding opportunities that have been outlined. How is the route map progressing? How much interest in that route map have you received?

Jo Pike: Last year, when the route map was published jointly with the Scottish Environment Protection Agency, with input from a huge variety of stakeholders, it was encouraging to see a massive amount of interest, including from some of our international stakeholders. They told us that it added something new to the discussion, as well as bringing together some things that were already happening across a range of innovative levies, loans and investment opportunities. The document that was created included nine pathways, each of which is owned by different stakeholders. The Scottish Wildlife Trust and SEPA provided the space for the conversations to come together and the pathways to be defined.

I will home in on a couple of the pathways. The nature climate bond was an innovation that resulted directly from the £1 billion challenge that we ran. It built on an existing model that has been developed by Abundance Investment, which is working with a number of local authorities south of the border to deliver climate-related impacts, such as LED lighting and carbon reduction strategies.

That provides an opportunity for ordinary citizens to engage in the process through crowdfunding investment platforms. With the £1 billion challenge, we looked at how to bring nature into the picture, in order to tackle the nature and climate crises together, which is enormously important. Ian Dickie was talking about the importance of being joined up and, as Eilidh McTaggart said, that policy coherence is really important.

Often, it is harder to see the monetisable elements of the nature part of the picture than it is to see the carbon reduction strategies. The

fundamental idea is that you are investing in the creation of habitats for wildlife. Take something like sustainable urban drainage systems, which the Scottish Wildlife Trust engaged in two years ago in Cumbernauld, with Scottish Water. In that case, it was a series of ponds, which provided an economic benefit through increased water filtration, lower pollution costs and so on, and it helped with flooding impact as well.

If we want to bring those two things together, rather than kicking the can down the road with the things that are a bit harder to fund, we need to understand that the two have to be part of the picture from the word go. I spoke to the City of Edinburgh Council the other day. It is leading on this area, but what it is doing would be replicable across other local authorities in Scotland. It has built that approach into its climate strategy for 2050, which has been approved by councillors and is going to the committee in the new year. Obviously, there has been a bit of a hiatus because of the pandemic. That is one really good example. It will not happen overnight, but there is massive potential there.

I will highlight a couple of other things across the range of pathways. The natural capital pioneer fund, which is a concept that is being developed by a company called Conservation Capital, is in urgent need of an investment-readiness facility. That is basically ready to go. Conservation Capital is engaged in all sorts of other things worldwide and Neil Birnie, who heads it up, is based in Scotland. It is an opportunity in Scotland that is ready to go if, as a nation, we can put in place that investment-readiness support. Investors are lined up to match public funding.

The final pathway that I will mention is the invasive species pathway, which is a really important opportunity. At the moment, it is not going anywhere because it is not at the stage at which there is sufficient resource to make it of interest to commercial players. The idea was inspired by conversations prior to the £1 billion challenge with people who, maybe 15 years ago, had been involved in the early stages of climate finance. One of the penny-dropping moments for them was an idea regarding renewable energy sources, ground-source heat pumps and that kind of thing, which involved putting in place finance whereby someone could take out a loan to buy a low-carbon heating system then pay back the loan based on the savings that that generated. That seems really obvious to us all now, but we do not apply that kind of thinking to invasive non-native species, which cost the Scottish economy an enormous amount of money every year—I cannot remember how much, but I think that an almost decade-old report said that it is something like £20 million every year, and that figure will probably be bigger now and will get worse with climate change. The science on invasive non-native species is telling us that we should be moving from constant management, which is costly in itself and does not get to the root of the problem, to prevention. We need to apply the same thinking.

Lloyds Bank was really interested in that. It is another example of where we need that early public funding to put in place some resource to move it forward to the next stage before it becomes properly interesting to the commercial players.

Lots of things are happening across the other six pathways. I will not go into those just now. The Scottish Wildlife Trust is leading on the Riverwoods project, which is developing blended finance principles—you heard Professor Helm talking about the importance of river catchments and riverbank woodlands. I would be happy to provide any further information on any of the other mechanisms.

Jenni Minto: Thank you. I am aware of the investment in relation to Rhododendron ponticum. [*Interruption*.] The key word there was "rhododendron".

The Convener: Sorry—we lost connection for a minute. I ask Jenni Minto to repeat what she said.

Jenni Minto: I was commenting on Rhododendron ponticum. I know that investment is being made in on-going clearing work.

Given what Jo Pike has just been talking about, my next question is to Eilidh Mactaggart from the Scottish National Investment Bank. How do we ensure that private funds achieve the right outcomes for the climate and nature? How does the bank support that?

Eilidh Mactaggart: The bank is unique in that we will invest only where we can get an outcome. It is commercial investment, so we can recycle our capital and create a perpetual fund that addresses one of our missions.

Increasingly, we see our net zero mission as a bit of a common—[*Inaudible*.]—investment in net zero. For example, I am quite proud of our investment in the PfP Capital mid-market rent fund, which provides affordable housing for key workers and others close to town. In making that investment, we encouraged the fund manager to improve the energy efficiency of the buildings and drive the net zero agenda in that regard. That has two positive outcomes: people who live in the properties with affordable rent have lower bills for the long term, and there are obviously better outcomes for the planet from having more energy-efficient buildings.

We take all those things into account in everything that we do. As I have mentioned, private sector investors are increasingly looking to

do that. NatWest has announced billions of pounds of investment in sustainable finance. Jo Pike mentioned Lloyds. Big institutional investors such as Allianz and Legal and General, big pension funds in Scotland such as Strathclyde Pension Fund and Lothian Pension Fund, and bigger ones throughout the United Kingdom, such as the Royal Mail fund, are keen to embrace purposeful investment along with the income that they need to generate to cover their pension liabilities.

We do that solely—we will not invest unless we get a mission impact from the investment. That is one of the key bases that Mariana Mazzucato came up with in supporting the design of the bank. Other organisations are increasingly doing that, although not solely as the bank does. We talk about our missions as our first filter for investment. We consider which of our missions an investment would support or address. The net zero mission is an increasingly common theme across all our investments.

The Convener: I get the feeling that investors are treading water at the moment. There is a bit of a pause. It is not entirely clear where money should be invested to get the best return for climate change and biodiversity. Professor Helm said that we need to base some of our work on river catchments. and non-native invasive species play a role in that consideration.

Ian Dickie has done a lot of work on the state of natural capital in the Borders. That involves baselining a range of things including woodland creation, habitat creation, flood management and farmland management. Do we need to do that across the country before we know where we should invest?

There has been a fairly critical report from the Climate Change Committee that suggests that there is no detail of the policies that underpin the Scottish Government's ambitions to reach net zero by 2045. That is also creating uncertainty. Does the Government need to do some baselining and put some meat on the bones of the policies before we invest in the right areas?

11:45

Ian Dickie: The answer is basically yes, for a couple of reasons. First, if we do not measure the baseline accurately, it is hard to know what extra impact any public policies or spending will have, and it is harder for investors to know what impact the investments will have. We want a bit of consistency in how that is done so that we can broadly and consistently compare investment options in the Borders with those in the central belt or the Highlands.

Establishing that baseline does not involve that much original work; it involves connecting together existing data sets better. In England, in particular, the agencies that give agricultural subsidies to those who manage biodiversity impact have often used separate data, which leads to separated decision making. I have also seen that in the private sector. One data set has been used to determine net positive for biodiversity and a different data set has been used to measure the carbon impacts of changes in land management. That data has to be joined up. It already exists in different forms, but integrated, multipurpose decisions cannot be made if it is not joined up.

Eilidh Mactaggart: The journey to net zero will be difficult. The reason why the Scottish National Investment Bank's vision is set to 2045 and why Governments are looking to long-term targets is that we cannot achieve net zero in the next five years. I think that policy will build generally over time, that it will become more fulsome and that it will capture some of the things that Ian Dickie has just talked about. A lot of individual data points have been gathered. It is about capturing them and ensuring that they are not working against one another in any way. Ian Dickie directed his comments to that.

Nobody has the perfect solution yet; if we did, everybody would be doing it across the globe. One of the good things about the climate emergency is that it brings together companies and Governments—we saw that a lot at COP26—to try to work out how we can achieve net zero, because nobody has a magic wand to make it happen. It will take a generation at least—and potentially longer—to change the world and to move away from the reliance on oil and gas and towards more sustainable practices.

Every Government is faced with the challenge, and they will have to continue to build policies, learn from each year and each decade of transition, do things better and look to one another to influence and learn. We speak to other development banks all the time about what they have done on their journeys and we learn from them. I am sure that my policy colleagues in Government have similar interactions to ensure that we get the best solutions.

The Scottish National Investment Bank has £2 billion, which is a lot of money, but it is not enough to address the matter by itself. We encourage private sector capital alongside every investment that we make because the challenge is so large, and a lot of investment is required to get us there.

Jim Fairlie: I might be missing something, but I am still not 100 per cent clear about where private investment relating to carbon gets a return, if the market is not to be highly regulated. Are we in danger of repeating what happened when we had

subsidy quotas in farming? People started to trade in quotas rather than in livestock, for example. They sold quotas, and we created a whole new economy of quotas.

In our evidence session on 24 November, David Finlay from the Ethical Dairy said:

"The Ethical Dairy is sequestering 5 tonnes per hectare per year, and we are emitting 4.5 tonnes per hectare per year, according to Agrecalc. If I sell that 5 tonnes of carbon credit, I am no longer net zero. I do not understand how the industry can sell its carbon credit without becoming carbon positive."—[*Official Report, Rural Affairs, Islands and Natural Environment Committee*, 24 November 2021; c 14.]

The chair of the Scottish Land Commission has said:

"We have had a number of concerns raised recently from people across different land use sectors and by stakeholders of the Tenant Farming Advisory Forum about the pressures farmers and crofters are facing to sign over carbon rights.

This is a fledgling market and there is a risk decisions are being made without full awareness of the implications for individual land managers. I would encourage landowners and land managers to exercise caution when considering transferring carbon rights or options until there is greater clarity over issues such as ownership of the rights and the need to retain them in offsetting their own business emissions in the future."

I know that Eilidh Mactaggart said that the industry is a fledgling one, but is that not all the more reason to ensure that we get this right?

Eilidh Mactaggart: I agree that we must try to get it right. The comment at the end of the quote that you read out about companies, individual farmers or landowners looking to create their own net zero before they start trading some of their carbon credits with others is absolutely right.

We look at the corporate sustainability of the bank's portfolio as a whole with every investment that we make. Many corporates and Governments are on that journey. We must try to get it right. I am not sure that there is a perfect solution, and there will be an element of trial and error as we go forward. As long as everybody is pushing in the right direction, we will get those reductions and use responsible methods for offsetting, such as the trading of quotas that we talked about. I am not aware that that is the sort of market that one would want to create, but there is a place for offsetting while we reduce emissions in order to get to net zero.

We will be on that journey for the next 25-plus years. Whether we will all achieve our goals in those years is something that we will only know afterwards, but it is a long window for the general public to understand. We need to break things down into what we can achieve in five, 10 or 15 years in order to get the general public to better understand what the journey to net zero involves. It seems like a very long time to them at the moment.

Jim Fairlie: On carbon trading, I see real barriers in the way. If a farmer is net zero, he does not have anything to sell: he is net zero. If he has a surplus, he can trade it. We need to be very careful about this.

I am sorry, convener; I am hogging the microphone.

The Convener: That is fine. Pat Snowdon would like to come in.

Dr Snowdon: I should point out that the woodland carbon code has not really got into what we might call a secondary market. The transactions are all done over the counter directly between investors and either intermediaries or landowners. The majority of our schemes have been quite small. We are now under pressure to look at the secondary market, so we are considering that, but we are treading quite carefully.

IHS Markit, which runs our carbon registry and is based in New York, is also quite cautious about the matter. It is perhaps a natural progression for the market to think about moving from where we are with over-the-counter sales into some form of secondary market, but we are not really there yet and we are thinking very carefully about whether it is the right thing to do.

Jim Fairlie raised an important point about farmers and accounting. The challenge is that a carbon credit can be used only once by one entity. It cannot be used by two. You are therefore absolutely right that, if a farmer sells a credit, he or she cannot use it themselves. I recognise that as a challenge but, at the end of the day, a credit can contribute either to reducing the farmer's footprint or to reducing somebody else's, but not to both. However, I understand the point that you raised.

Rachael Hamilton: My question is for Jo Pike. You talked about Riverwoods, which is the conservation covenant that is being looked at in England and Wales. Are you aware of any Scottish Government funding for riparian tree planting?

Jo Pike: First of all, Riverwoods is broader than the idea of covenants. We looked at covenants that are used in other places, but Riverwoods explores the full range of ways of financing riparian restoration. The existing forestry grant scheme has mechanisms that enable people to do planting, and one of our recent conversations with stakeholders was about whether there are ways that those could be optimised or, indeed, better communicated. Some things might be possible that people are not currently aware of.

We are looking at a model that is broadly based on something called the forest resilience bond, from the United States. That is predicated on reducing the costs of forest fires. In Scotland, the parallel would be reducing the costs of flooding. Essentially, it is about interventions to deliver nature-based solutions such as planting and restoration of riparian areas. That should involve having good baselines and mapping out the opportunities to increase connectivity as much as possible.

From the list of interventions that are made for nature, a list of benefits flow from them. In this case, there is improved flood protection, but there is also water temperature regulation. Professor Helm talked about the whisky industry, and water temperature is certainly of material consideration to that industry. To salmon fisheries, it is a critical issue that will become even more important with climate change. There are also other benefits, such as reduction in soil erosion and carbon benefits.

The third list is the list of beneficiaries of those benefits. The fourth list is a subset of that: it is those beneficiaries who would be willing and able to pay, over a long period, to realise those benefits. That is how the forest resilience bond was built. It is much further ahead than we are. Whether it involves local authorities, whisky companies or Scottish Water, which is a key stakeholder, there will be parts of river systems that can be financed in that way and parts that cannot.

Rachael Hamilton: If I were a landowner and I wanted to cool my waters and increase the salmon population, could I apply to a Scottish Government fund to pay for riparian tree planting?

Jo Pike: Pat Snowdon might have the details of exactly what you could get through the current forestry grant scheme, but, with Riverwoods, we are trying to scale up that thinking to catchment scale so that we can maximise the opportunities for landowners to work together and deliver nature networks. That is the heart of the approach. There is a commitment to nature networks in every local authority in Scotland.

In terms of the best use of public money, we should think about nature networks across the whole of Scotland, and riparian networks are a brilliant example of that. A colleague of mine often says to me that we would never build a road or expand the rail network without knowing what we want to link up to. We need to start thinking about nature in that way, too. That is critical to the concept of Riverwoods.

Karen Adam: My question is for Ian Dickie and is about the characterisation report and the main opportunities for investment that it identified. Was the issue looked at in a holistic way? Particularly during Covid, quite a lot of farms diversified into agritourism, for example. We are talking about natural capital but, from a local point of view, who were the stakeholders that were involved? This is not about natural capital, but I have a coach company in my constituency—do not worry, convener, I am not advertising, so I will not give the name—that is trying hard to encourage people out of their cars and on to coaches to access what we would call our natural capital. We could probably call that company a facilitator. Was it included as a stakeholder? Were the main opportunities for investment seen in a holistic sense?

Ian Dickie: Yes, I would say that we were trying to look at the issue in a holistic sense and draw together all the interests in the natural environment. The data that we used originated before the Covid pandemic, so the changes that the pandemic has brought in the way that people use the environment are not reflected in the work. It would probably be difficult to build that in even now, because we do not always have a clear picture of how behaviours might have changed and how they might change in the future.

12:00

We thought about the visitor economy and the opportunities around that. Visits to the natural environment have benefits to local people in terms of their wellbeing and health, and visitors from outside an area bring expenditure. We tried to include those things. We did not look further down the supply chain in those different sectors to include transport companies, for example, but the value of the activities that we looked at reflects the opportunities for service providers, including those companies. We tried to reflect the different stakeholders, so, when we looked at the information, we linked environmental data to calculations that reflected the economic value of different benefits to society.

In doing so, we also considered the distribution of those benefits across society—across different groups in society now and also between current and future generations. An important and practical point about the natural capital approach is that it looks at the environment as an asset in relation to what it can provide in the future. The five-year and 10-year investment processes have just been referred to, but, to appreciate the full benefit of a lot of environmental assets, we have to look 50 or even 100 years into the future. There is an interesting contrast there. You want a consistent basis for looking at benefits. If there is a change in agricultural land use, there is an opportunity cost in relation to lost production. That needs to be considered consistently across different areas of

land. Similarly, for other opportunities that will provide benefits, you need to use the full timescale to calculate their full value to society.

Beatrice Wishart: I will ask Ian Dickie to respond first to my question but if other panel members want to come in, that would be helpful. Earlier, Professor Helm talked about the polluter pays principle and having a carbon price. How could fiscal measures such as taxes or levies be used in responding to the nature and climate emergency and as drivers for changing behaviour? Also, how could taxes and levies be used in the rural and marine economies?

Ian Dickie: I agree with Professor Helm that getting the price of carbon right is important. To pick up on an earlier point, people needing to pay for carbon offsets acts as an incentive for them to reduce their emissions, so it is not an either/or option. EFTEC is a small business. We buy an offset for our unavoidable emissions, which is a cost; it is a reduction in our profit, which gives us an incentive to work in as low carbon a way as possible, and I think that we do that.

There are opportunities to use economic instruments. I would not say that it is just about taxes or levies. One thing to appreciate about the different environmental markets is that they are driven by regulations. Unless there is a regulatory target that people are trying to comply with, an environmental market will not emerge for people to find ways to deliver that target. That is the case with carbon emissions and it is also the case with the biodiversity net gain market that is starting to form in England. Those markets need good regulations and good rules to function well.

There are opportunities to use such economic incentives but there is also an important role for regulation to maintain minimum standards. As Pat Snowdon mentioned, there are now screening processes to ensure that forestry creation happens in the right place. Those minimum standards should be maintained alongside the operation of environmental markets.

The Convener: As I cannot see anybody else wanting to come in to address the concept of taxes, fees and levies being used, I will move on.

Is it not really difficult to talk about such things, including regulations, particularly when it comes to agricultural strategy, when the CCC has said that there are big ambitions but there is nothing to demonstrate that we might deliver on them because there is no clear strategy in place for achieving them? We cannot really start talking about fiscal measures if we do not know the direction of travel. Is the issue that we do not actually know what the policies are to deliver on climate change and biodiversity loss, as the CCC quite clearly pointed out at the beginning of this week?

Dr Snowdon: I can speak from the forestry perspective. Scotland has a climate change plan, which was updated in the past couple of years. It looks right across the economy at how different sectors will meet Scotland's climate change targets. In forestry, we set out increased planting targets to help to meet those ambitions. There is an objective to increase the use of timber in construction. We aim to match our funding to requirements and to achieve targets over time.

In terms of instruments, it is about not just grant support but the Woodland Carbon Code as an incentive to increase planting. The key factor underlying the Woodland Carbon Code is the concept of additionality in carbon markets, whereby it targets projects that would not have gone ahead in the absence of the sale of carbon credits. There are a number of different instruments being used in the forestry sector to meet targets within the resources that we have. Ian Dickie might want to comment on the work by EFTEC to look at the funding gap for meeting targets in the future. Measures such as the Woodland Carbon Code that can lever in additional private finance will be important in meeting targets.

Jo Pike: On the big picture and clarity in the direction of travel, the science is clear: there are five well-recognised drivers of biodiversity loss. Although there are areas of uncertainty and there is a data gap, a finance gap and an implementation gap, all of which I would suggest require effort and resource simultaneously, it is important to recognise that we have things available to us at the moment that can help us to move forward.

Going back to the advisory group on economic recovery that Professor Helm was part of and the recommendations that it put forward to the Scottish Government, one approach to building in a holistic and joined-up way of dealing with climate change and biodiversity loss is what the advisory group calls a four-capitals approach. Traditionally, our economies are based on financial capital but, if we think holistically about financial, human, social and natural capital and build that into the economic strategy, there is an opportunity for Scotland to play a leadership role.

There is something for us to learn from the pandemic and the development of vaccines, which everybody thought would take 10 years. When it comes to the critical path of things that need to happen to tackle the environmental emergency that we are in, we probably need to challenge our thinking about what has to happen sequentially and what can happen in parallel. The vaccine problem was solved by breaking the rules and

starting to manufacture vaccines before there was regulatory approval—certain things could happen at the same time. That is the most important lesson when it comes to the big picture.

When the Scottish biodiversity strategy is developed next year, that will be hugely important and, following the creation of nature targets that have been committed to, it will put nature and climate change targets on a par. It is hugely helpful that the First Minister has publicly acknowledged that those two things must be tackled together—it is crucial.

The Convener: There is a supplementary question from Rachael Hamilton.

Rachael Hamilton: I would like to go back to Pat Snowdon. Sectoral pathways are not yet policies as such, particularly those on agriculture, so there is no way to measure emissions, as the Climate Change Committee said. That is a difficult position for land users and land owners to be in. On the point that I made about riparian tree planting, has the Scottish Government implemented any funding strategy to incentivise people to plant riparian trees?

Dr Snowdon: Yes. Scottish Forestry dispenses a range of grants for different woodland types, including for planting in riparian areas. The riverwoods scheme is not just confined to planting right next to rivers; it is also for flood plains and surrounding areas. If it would be helpful, I would be happy to send the committee further details of our grant schemes and the different types of woodlands that are supported under them.

Rachael Hamilton: Thank you.

The Convener: That brings us to the end of the evidence session. I thank our witnesses for their evidence and their considered responses to our questions.

We will suspend the meeting briefly.

12:10

Meeting suspended.

12:22

On resuming—

Subordinate Legislation

Private Storage Aid Scheme (Pigmeat) (Scotland) Regulations 2021 (SSI 2021/398)

The Convener: Our second agenda item is consideration of a piece of subordinate legislation. This instrument is subject to the negative procedure. I refer members to paper 3 and to pages 21 to 24 in our papers pack.

Does any member wish to raise any issues regarding the instrument?

Mercedes Villalba (North East Scotland) (Lab): Would it be possible to write to the Scottish Government to ask for an update on how the scheme is running and what the sector is saying about how effective the scheme has been in supporting the industry?

The Convener: We can certainly do that. We can write to the Scottish Government with any queries.

Rachael Hamilton: We should also ask about issues relating to the Chinese licence being withdrawn and whether the Covid outbreak at the pig abattoir in Brechin affected the Scottish Government's decision to bring forward the intervention.

The Convener: Okay. I would like to ask how the private storage aid scheme links in with the previous hardship scheme—which ran for, I think, three weeks—and whether the Government has any plans to reintroduce that scheme.

I would also like to raise the issue of potential fraud when funding is provided to store carcases. What checks are in place to ensure that carcases are not processed early and released back into the food chain, with the use of butchering facilities outwith Scotland? We should also find out how much funding is available in total through the scheme.

Rachael Hamilton: I would like to know which budget the funding is coming from. Producers are obviously incredibly important to animal welfare so, from their point of view, I would like to know the capacity of the scheme.

Jim Fairlie: We should ask about capacity in order to know what volume will be stored. In addition, will there be a market trigger for when the meat can be released back into the food chain?

The Convener: As there are no more comments, are members content to note the instrument?

Members *indicated agreement.*

The Convener: I will write to the cabinet secretary with the questions that have been raised on the instrument.

That concludes the committee's public business.

12:26

Meeting continued in private until 12:51.

Published in Edinburgh by the Scottish Parliamentary Corporate Body, the Scottish Parliament, Edinburgh, EH99 1SP

All documents are available on
the Scottish Parliament website at:

www.parliament.scot

Information on non-endorsed print suppliers
is available here:

www.parliament.scot/documents

For information on the Scottish Parliament contact
Public Information on:

Telephone: 0131 348 5000
Textphone: 0800 092 7100
Email: sp.info@parliament.scot

The Scottish Parliament
Pàrlamaid na h-Alba