DÁIL ÉIREANN

AN COISTE UM FHORMHAOIRSIÚ BUISÉID

COMMITTEE ON BUDGETARY OVERSIGHT

Dé Máirt, 18 Meitheamh 2019

Tuesday, 18 June 2019

The Joint Committee met at 1.30 p.m.

Comhaltaí a bhí i láthair / Members present:

Maria Bailey,	
Richard Boyd Barrett,	
Declan Breathnach,	
Thomas P. Broughan,	
Lisa Chambers,	
Barry Cowen,	
Pearse Doherty,	
Martin Heydon,	
John Lahart,	
Michael McGrath,	
Eamon Ryan,	
Brian Stanley.*	

* In éagmais / In the absence of Deputy Jonathan O'Brien.

Teachta / Deputy Colm Brophy sa Chathaoir / in the Chair.

Deputy John Lahart took the Chair.

Business of Select Committee

Vice Chairman: Apologies have been received from Deputy Jonathan O'Brien, for whom Deputy Stanley will substitute. The Chairman will be here in due course. I am sitting in for him for the first section of the meeting.

Today the select committee will meet stakeholders from the Climate Change Advisory Council; the Economic and Social Research Institute, ESRI, and the Department of Communications, Climate Action and Environment. The purpose of the meeting is to consider the budgetary implications of climate change measures. Before we begin, I propose that we go into private session to deal with some housekeeping matters. Is that agreed? Agreed.

The select committee went into private session at 1.35 p.m. and resumed in public session at 1.40 p.m.

Budgetary and Fiscal Implications of Climate Change: Discussion

Vice Chairman: Today's pre-budget hearing deals with climate change issues. Actions to mitigate the causes and impacts of climate change are likely to have a significant budgetary impact on both revenue and expenditure. The purpose of this committee meeting is to discuss the long-term budgetary implications of climate changes measures, including climate change targets and compliance costs, the budgetary impact of measures to introduce carbon taxes, and the long-term changes to yield for the Exchequer arising from climate change measures.

I remind members and witnesses to turn off their mobile phones as they interfere with the sound quality and transmission of the meeting. I welcome Professor John FitzGerald, chair, and Mr. Phillip O'Brien, council secretariat, from the Climate Change Advisory Council, CCAC. I welcome Dr. Kelly de Bruin, research officer, and Dr. John Curtis, associate research professor, from the Economic and Social Research Institute, ESRI. I welcome Mr. Frank Maughan, principal officer, Mr. Kevin Brady, principal officer, and Mr James Coade, administrative officer, from the Department of Communications, Climate Action and Environment. I thank all of the witnesses for making themselves available for today's meeting.

Before we hear the opening statements by witnesses, I draw their attention to the position on privilege that applies to witnesses. By virtue of section 17(2)(*l*) of the Defamation Act 2009, witnesses are protected by absolute privilege in respect of their evidence to the committee. However, if they are directed by it to cease giving evidence on a particular matter and continue to so do, they are entitled thereafter only to qualified privilege in respect of their evidence. They are directed that only evidence connected with the subject matter of these proceedings is to be given and are asked to respect the parliamentary practice to the effect that, where possible, they should not criticise or make charges against any person or entity by name or in such a way as to make him, her or it identifiable. Members are reminded of the long-standing parliamentary practice to the effect that they should not comment on, criticise or make charges against a person outside the Houses or an official, either by name or in such a way as to make him or her identifiable. I ask each of the witnesses to make their opening statements, which will be followed by questions and answers. I invite Professor FitzGerald to make his opening statement.

Professor John FitzGerald: I submitted my statement before the plan was published. I will say a few words on the plan. The Climate Change Advisory Council, CCAC, welcomes the

plan that was published yesterday as a major step forward. It includes realistic sectoral targets and appropriate governance to ensure a successful transition. It provides for an early warning to be issued if we are underperforming. Rather than making optimistic assumptions about oil prices, which would reduce the magnitude of the challenges we face, the plan is more realistic. This is to be welcomed. The next task is to ensure the detailed measures proposed in the plan are implemented in an appropriate timescale.

As the statement I have submitted makes clear, the costs of doing too little on climate change are far greater than the costs of doing too much. We should be erring on the side of caution by doing too much, but we are actually doing too little. Ireland has set itself a binding target of decarbonising by 2050, with key milestones along the way. The plan sets out realistic targets for 2030. Out to 2050, however, it involves a significant rate of acceleration. If we had seen a trajectory to 2050, we might be able to say we should be doing more by 2030 to meet the 2050 target. That remains to be seen. Our job is to provide independent advice on the most cost-effective way of meeting our climate change goals.

On carbon taxation, a wide range of research in Ireland and elsewhere shows that if global warming is to be halted, it is essential that we raise the cost of emitting greenhouse gases. One of the key messages from the CCAC in successive reports has been that if we are to make progress, we need to implement rising carbon taxes that reflect the potential damage done by emitting greenhouse gases. Various other measures and policies are needed to bring about decarbonisation, but they will be significantly undermined if emitting greenhouse gases remains the cheap option. The carbon tax in Ireland and the carbon price in the EU emissions trading system are too low. That is one of the reasons we are underachieving.

It is important to put a price on carbon dioxide emissions for three key reasons. First, it discourages the use of fossil fuels and makes it comparatively cheaper to use electric cars and upgrade our homes. If emissions are priced appropriately, businesses and the Government will find that the elimination of greenhouse gas emissions saves money. Second, carbon pricing, especially the carbon tax, provides the Government with revenue it can use to compensate or support those who are on low incomes. Such revenue can be used in the budget to reduce other taxes or to increase expenditure. Research shows that shifting from taxes on labour or indirect taxes to taxes on carbon can increase employment. The use of the revenue from a tax of this nature can affect the distributional effects of the tax and can have beneficial effects on the economy as a whole. The third and most important reason to price emissions is to incentivise businesses and households to invest in new technologies. This will allow us to continue to enjoy a reasonably high standard of living while eliminating greenhouse gas emissions.

Those involved in companies like Volkswagen are investing billions in the development of electric cars not because they are nice people but because they know they will be priced out of the market if this does not happen. This shows that the expectation that prices will increase drives technological development. The current carbon pricing levels are too low to drive real change. In light of our failure to take action in this respect in the previous budget, I suggest that the carbon tax should be increased to €35 a tonne in the next budget, with a commitment to increasing it to at least €80 a tonne by 2030. It is important for the Government and the Oireachtas to give a commitment to an increasing trajectory over time so people know that if they invest in reducing emissions, they will make money in the future.

A massive body of evidence from across the world shows that carbon taxes are essential. There are very few carbon tax deniers in the economics community. A recent statement by a large number of American economists, including 27 Nobel prize winners, identified carbon

taxes as essential for the US and the world. The OECD and the EU led the way in 1990 and 1992, but unfortunately Ireland rejected the proposal to raise a carbon tax at EU level in 1992 on the basis that we did not believe in tax harmonisation. That was a very unwise move by Ireland at the time. The research carried out by the ESRI showed that it would have been beneficial for Ireland if it had gone ahead with that EU proposal. There have been many papers since 1992, some of which two colleagues from the ESRI have been involved in, all of which show that carbon taxes are essential to driving the decarbonisation of the economy. There has been at least one per year over a 30-year period. The council advocates hypothecation of the revenue from carbon taxes, using it to compensate those on low incomes who might otherwise carry a disproportionate share of the additional tax burden, promoting investment in dealing with climate change, and returning residual income to households.

As long ago as 1992, an ESRI study indicated that 30% of the revenue from a carbon tax would need to be used to compensate those on low incomes. Many papers since then have considered the issue. A useful paper by Barra Roantree from the ESRI published last week considers a range of options that provide the information the Government and Oireachtas need to determine how best to carry out a just transition. While advocating a just transition approach, the council has not favoured a particular scheme for achieving it. Detailed policies on how best to redistribute income are a matter for the Government and the Oireachtas, not for an advisory group on climate policy.

It is important that the investment programme to be financed in budget 2020 be subjected to rigorous assessment using the parameters of the revised public spending code, PSC. This code assumes that an appropriate price of carbon for 2050 is €260 a tonne. Using the recommended discount rate in the code, this implies a price today of approximately €80 a tonne. In planning for the future, the Government should take account of the fact that saving emissions is worth €80 per tonne today and could have a significant effect, for example, on the State's investment in vehicles. In planning to ramp up investment in retrofitting houses and other buildings, it will be important to take account of the capacity of the building industry to deliver. The plan pays particular attention to this issue, which is welcome. The expertise and skills need to be developed to undertake this work and this may take some time. However, the plans states that these investments in retrofitting houses will make sense if the carbon price is €30 or €80 per tonne. It emphasises that this will not happen unless the carbon tax is raised, as we recommend. One way of developing this expertise would be to gradually ramp up contracts to retrofit the stock of local authority dwellings owned by the State. The State is the landlord and is responsible for doing so. In doing so, the State would signal that investment in this sector will be a major feature of the coming decades. Developing the building industry capacity and skills to deliver it will be worthwhile. This investment would also substantially reduce emissions from families in local authority dwellings, many of which are on low incomes, and substantially reduce their expenditure, thus benefitting them in other ways and, in the case of more elderly tenants, bring significant health benefits.

In conclusion, carbon pricing alone will not deliver the necessary emissions reductions but delivering emissions reductions without a sufficient carbon price will be almost impossible and certainly much more expensive. Increasing the cost of emitting carbon is not a once-off commitment but must be sustained over the coming decade.

Vice Chairman: I call Dr. de Bruin to make her opening statement.

Dr. Kelly de Bruin: I thank the Chairman for the invitation to appear before the committee. I am head of the climate economy modelling team at the ESRI, and I am accompanied by my

colleague, Dr. John Curtis. This committee is considering the budgetary implications of issues relating to climate change. The specific design of a climate policy will have ramifications for its environmental, economic, distributional and budgetary impacts. It is critical that policies are well designed to ensure emissions reductions, minimise the economic disruption and be distributionally fair whereby those most able to bear the costs do so.

In this opening statement, I will give the committee an outline of the current work being conducted at the ESRI on the carbon tax and convey our results concerning this issue. Our goal is to provide insights into the impacts of increasing the tax to guide policy formation. I will focus on our results concerning the increased revenue resulting from a carbon tax increase, the impacts on emissions, macroeconomic impacts and distributional impacts across production sectors and households.

To contextualise our results, a general understanding of our methods is useful, hence I will first give a short non-technical overview of our model. The Ireland, Environment, Energy and Economy, I3E, model has recently been developed by Dr. Aykut Mert Yakut and I. It examines the relationship between the economy, energy use and the emissions of greenhouse gases. In technical terms, it is a macroeconomic intertemporal computable general equilibrium model, which reproduces the structure of the economy in its entirety. It includes 32 distinct production sectors, 37 different goods, ten households types, three labour types, trade and the government, among others. It is a dynamic model, which incorporates economic growth over a modelling horizon that runs from 2014 to 2050. Under the model, the nature of all existing economic transactions among diverse economic agents is quantified. It examines how inputs and outputs flow between production sectors of the economy and result in final goods consumed by households. The I3E model includes energy flows and emissions in addition to the standard monetary flows.

Each production sector produces an economic commodity using labour, capital, material inputs and energy inputs. The I3E model explicitly comprises a set of carbon commodities, including peat, coal, natural gas, crude oil, fuel oil, LPG, gasoline, diesel, kerosene and other petroleum products. Based on relative prices, producers can change their production inputs to minimise costs. Similarly, consumers can change their consumption patterns based on relative costs to maximise their utility. The explicit modelling of intersectoral linkages makes it possible to investigate the wider economic impacts of a specific policy, such as a carbon tax, through the different transmission channels in the economy. We examine the impacts of an increase in the carbon tax of €10 in 2020 with further increases of €5 a year after that reaching a carbon tax of €80 in 2030.

I will first focus on the case where carbon tax revenues are used to reduce Government debt. After that, I will discuss our investigation of different revenue recycling schemes to understand how carbon tax revenue can be used to limit the economic and distributional impacts of the carbon tax increase. Increasing the carbon tax by €10 in 2020 would increase expected carbon tax revenue from €459 million to €666 million in 2020 and the additional increments in the tax would increase carbon revenues from €682 million to €2.138 billion in 2030. However, when this carbon tax revenue is not recycled but used to reduce Government debt, our model shows that revenue impacts are likely to be negative, where large decreases in the receipts of sales taxes, wage taxes and corporate taxes, due to decreased economic output and consumption, outweigh the increase in carbon tax receipts.

Household emissions are estimated to decrease, on average, by 10% in 2030 compared to no increase in carbon tax. These results are in line with other ESRI work, which develops

a behavioural microsimulation model and econometrically estimate the behavioural response of households to a carbon tax increase in terms of direct carbon emissions. We find that rural households reduce their emissions substantially more than urban. Economy-wide emissions in 2030 are estimated to be 15% lower with the carbon tax increase then without it. Over time, however, emissions still increase, with 2030 emissions almost 27% higher than 2018 emissions. Our model is likely to underestimate emission reduction as we do not explicitly include new technologies in the model, though it is clear that in absence of other climate policies, the carbon tax would need to be significantly higher to reach the Irish EU emission targets.

Real GDP will be lowered by 0.3% in 2020 compared to no increase in tax and will be 0.6% lower in 2030. Wages will decrease, where low-skilled labour is impacted most. The most impacted production sectors are transport, mining and electricity with value added reductions of up to 2.7%, compared to a situation where there is no increase in the carbon tax. Comparing impacts across households, we find a strong regressive trend, where poorer households are impacted the most in terms of disposable income, consumption, price increases and welfare. In terms of welfare, rural households are impacted more than urban. This is in line with the findings of Tovar Reanos and Lynch, as well as other ESRI work which applies the ESRI's tax and benefit microsimulation, SWITCH, model, which replicates the tax and benefit system of Ireland in a high level of detail. The Ireland Environment, Energy and Economy, I3E, model finds higher impacts, as it includes secondary impacts such as price changes to non-carbon goods, macro-economic impacts and household income impacts via wage and capital income.

A major concern about a carbon tax is that it is often regressive in nature. We see the same effect in Ireland. Distributing carbon tax revenues to households is often proposed as an effective way of reducing the regressive aspects of the tax. We have examined two transfers schemes to see what the impact might be. Under the first, carbon tax revenues are given back to households on a *per capita* basis. Under the second, revenues are distributed based on relative current welfare transfers. In terms of real disposable income, a lump sum transfer would significantly decrease the regressive trend of the tax, having positive impacts for rural households and negative impacts for urban households. Applying a transfer based on social welfare, we find a decrease of a lesser degree in regressiveness. Both Tovar Reanos and Lynch and Bercholz and Roantree, in their respective studies, find such transfers to have a higher impact in reducing regressive trends. Our results show that the secondary impacts of these distribution schemes - predominantly changes in wage and capital income - are regressive. Real GDP impacts remain negative, but they are almost halved when compared to when revenue is used to reduce Government debt. When applying social welfare or lump sum transfers, net Government revenue is estimated to increase by approximately €500 million in 2020.

It is often suggested the revenues from an environmental tax may be recycled to create a so-called double dividend, whereby other distortionary taxes can be reduced and economic growth boosted, while, at the same time, achieving emissions reductions. We have investigated various revenue recycling schemes and their impact on the economy, as well as their distributional impacts across households. Our results show that when carbon tax revenue is used to reduce other distortionary taxes in the economy, a double dividend can be achieved. Decreasing wage taxes, sales taxes or corporate taxes will result in an increase in GDP of up to 0.8% compared with no change in carbon tax, while still achieving significant emissions reductions. The impact on households will be positive, but it will have higher positive impacts on richer households. Value added in most sectors is boosted and value-added reductions are limited in carbon tax sensitive sectors, with the exception of transport.

If carbon revenue was to be used to reduce sales taxes, it would increase wage and corporate tax receipts owing to increased consumption, giving an increase in total Government revenues of approximately €660 million in 2020. Reducing wage taxes would boost production and receipts of sales taxes and corporate taxes, resulting in an approximate increase in total Government revenues of €1.6 billion in 2020. A reduction in corporate taxes would increase receipts of wage and sales taxes, thereby increasing total Government revenues by €1.3 billion and reducing more Government debt than when revenues are used directly to reduce Government debt.

We have found that the economic and budgetary impacts of a carbon tax will strongly depend on the policy design. A well designed carbon tax revenue recycling scheme can assist in reaching other policy goals such as economic growth and inequality reduction, in addition to emissions reduction. We wish the committee every success in its work and will be happy to assist members in the coming months.

Vice Chairman: I thank Dr. de Bruin and invite Mr. Maughan to make his opening statement.

Mr. Frank Maughan: I thank the select committee for the invitation to appear before it to discuss the budgetary implications of climate change and answer questions members may have.

The Government's new climate action plan which was published yesterday is a major milestone in Ireland's climate policy and represents a step change in our response to climate change. The plan sets out how Ireland will, at the very least, meet its targets for the period to 2030 and puts us on a trajectory to achieve net zero carbon emissions by 2050. The plan will have a strong focus on implementation, setting out more than 180 actions with clear timelines and steps needed to achieve each of them. It will follow a similar approach to that of the Action Plan for Jobs model and include annual updating of the plan with new actions, quarterly reporting on delivery, the establishment of a climate action delivery board to be chaired by the Department of the Taoiseach to hold Departments and public bodies to account, ongoing consultation and feedback which will inform each subsequent plan and ongoing review of changing costs and technologies to inform new actions being developed. The goals and targets set out in the plan are informed by analysis of the most cost-effective choices currently available to reach our 2030 targets. By articulating a decarbonisation ambition range for each sector, the framework provided by the plan will enable each sector to identify and put in place the most appropriate policy tools to deliver the stated ambition and enable Ireland to meet its 2030 targets.

As the committee will be aware, an objective of the Minister in finalising the plan was to follow closely the recommendations of the report of the Joint Committee on Climate Action, published in March of this year. That report was informed by the earlier work of the Citizens' Assembly, which reported in 2018. I will refer briefly to the main points mentioned in the committee's letter of invitation to the Department.

The first issue we considered was the revenue implications of increasing the price of carbon. The Government is committed to carbon pricing as a core element of the suite of measures to reduce greenhouse gas emissions in a sustained manner over time. Ireland is one of a minority of countries globally to have already implemented economy-wide carbon pricing, through its implementation of the EU's emissions trading system, ETS, for electricity generation and large industry and through a national carbon tax that applies in other sectors of the economy. The climate action plan, while recognising that taxation decisions are primarily a matter for the Minister for Finance, commits the Government to implementing a carbon tax rate of €80 per tonne by 2030, with a trajectory of increases over successive annual budgets. This was recommended by

the Climate Change Advisory Council in its 2018 annual review and was also broadly endorsed by the joint committee in its report. There is a clear rationale for both increasing the rate and for clearly signposting the desired future rate of carbon tax, as these actions provide a strong signal to households and firms of the need to invest in low-carbon alternatives where possible.

I will not dwell on the potential additional revenue that may be raised through the carbon tax. As the committee will be aware from tax strategy group analysis, each additional €5 in the rate of carbon tax could raise in the region of an additional €100 million per annum. The Government is, of course, concerned about the distributional implications of increasing the rate of tax. I understand the Department of Finance is considering a number of options in respect of the use of any additional carbon tax revenue in this regard. In addition, the Department is consulting on how additional revenue raised by increasing the carbon tax could be used. My colleagues from the ESRI have provided information on their detailed research programme examining both the revenue and emissions impacts as well as the distributional aspects of increasing carbon tax.

Another issue we considered is the medium-term expenditure requirements to achieve our EU 2020 and 2030 targets**.** The overall quantum of capital resources available to Departments and agencies is set out in the national development plan, NDP, for the period to 2027 in the context of the Project Ireland 2040 framework. The NDP allocates approximately €30 billion in Exchequer and non-Exchequer resources to climate action and sustainable mobility over the decade, the allocation of these resources to individual Departments being subject to the normal Estimates and budgetary process. However, achievement of the Government's climate policy objectives and the particular targets set out in the plan as published will not only rely on Exchequer funding. The plan also foresees a role for taxation policy and regulatory measures to bring about reductions in our emissions. These include setting a long-term trajectory for the carbon tax to change long-term behaviour and decision-making to encourage investment in more sustainable choices, and new regulations to end certain practices, such as phasing out oil and gas boilers in homes or banning the sale of new petrol or diesel cars from 2030.

The low-carbon transition will require significant private investment alongside Exchequer expenditure on a sustained basis over a number of decades. The Government will seek opportunities to leverage private finance with its Exchequer funding. For instance, in the first call of the climate action fund, which has an overall envelope of €500 million, a €77 million commitment from the fund was able to leverage a total investment of €300 million. NewERA will continue its work with the commercial State companies to identify priority opportunities in key sectors to mobilise private investment towards assisting in meeting our climate objectives.

The plan also envisages new ways of spending the Exchequer resources we do have. To maximise the impact of the €3 billion that was allocated to home energy retrofits under the NDP, we are reforming the current system to create a new retrofit delivery model. This envisages grouping houses together so that one contractor would retrofit batches of homes in the same area, developing smart finance products, with low-cost financing linked to energy performance improvements, and easy payback methods whereby households can pay back the cost over a longer period through, for example, a voluntary increase in their local property tax or electricity bill.

Another issue to consider is the cost of missing our targets. Ireland is required under EU rules to reduce emissions covered by the non-ETS sector by 20% relative to 2005 levels by 2020. Current projections by the Environmental Protection Agency, EPA, indicate that relevant emissions could remain at between 0% and 1% below 2005 levels by 2020. The relevant EU

legislation does allow member states to meet their targets by means of unused emissions allowances from earlier years or through purchasing credits from other member states or on international markets. This will allow Ireland to remain compliant with the EU rules even though our emissions will not have reduced to the mandated level by 2020. The Government spent approximately €120 million in total on the purchase of credits between 2007 and 2009, for which sum approximately 8.5 million credits were received by the State. Some of them were used towards Ireland's compliance with the Kyoto Protocol first commitment period in the period 2008 to 2012. On the cost of purchasing additional credits to meet our targets, the Department currently estimates the cost to be in the region of €6 million to €13 million, depending on the price and final quantity of allowances required. On 2030 compliance, the same arrangements in regard to purchasing credits will apply under EU rules. The Government's objective, however, is to avoid having to rely on this option.

With regard to other channels through which the budgetary process could assist in addressing climate change, robust rules on how we value the shadow price of carbon, as part of project appraisal for all public capital investments, are essential to avoiding expenditure that locks in long-term fossil fuel consumption. To that end, the Government, through the Department of Public Expenditure and Reform, is currently reviewing the PSC to improve the calculation of a shadow price of carbon. This proposal would see future Government capital investments valuing carbon at a level which will see the shadow price increase to €32 per tonne by 2020, €100 per tonne by 2030, and €265 by 2050.

The climate plan also includes a new commitment to ensure that all Government memoranda and major investment decisions are subject to a carbon impact and mitigation evaluation. The objective is to incorporate this requirement into Cabinet procedures, regulatory impact assessments and project appraisal processes. Consistent application of these rules will allow decision-makers to better understand and appreciate the climate consequences of their investment options.

That concludes my opening statement. My colleagues and I are available to answer any questions members of the committee might have.

Deputy Lisa Chambers: I thank all the delegates for their presentations. There was quite a lot to get through. I do not know how much time I have.

Deputy Colm Brophy took the Chair.

Chairman: The Deputy has five minutes for the first round.

Deputy Lisa Chambers: It will be impossible to get through all this in five minutes.

Chairman: The Deputy must make it possible.

Deputy Lisa Chambers: I will have to have another opportunity.

Chairman: We will come back to the Deputy.

Deputy Lisa Chambers: The climate issue is the greatest challenge facing our country. We have significant and difficult decisions to make as a Parliament and as citizens. We are not in agreement on how best to make those decisions and we do not agree on how quickly the aspirational elements of the Government's climate plan, which was published yesterday, can be achieved. While the plan is welcome, it is short on detail. No full costings are available.

We do not know how much it will cost to implement the plan or even whether it is possible to implement it within the timeframe. It is disappointing that we will miss our 2020 targets by a long way. It is even questionable whether the State can meet its targets for 2030.

My first question, which is for all three contributors, seeks their view on the costing of yesterday's plan. Is it credible? Is it achievable in terms of the timelines set out by the Government yesterday?

Chairman: I will take the witnesses in the order in which they made their presentations.

Professor John FitzGerald: The Deputy is right that it would be nice to have costings. Regarding implementation, what needs to be done needs to be spelled out. Considering the macroeconomic impacts and investment by people in electric cars, as is assumed will occur, there may not be a net increase in expenditure. The argument is that it will save people money if they buy electric cars over the next decade because they will be the cheaper option. At the moment, they are not.

With regard to the investment in retrofitting houses, there is a need to spell out how the programme is going to be ramped up. It is going to be a gradual process. It is not spelled out. An essential ingredient in the plan is that it recognises that the carbon price needs to be between €30 and €80 per tonne to make it worthwhile to undertake the investment. The size of the investment could be large. I refer to how it is scheduled. Regarding the public sector's role in this, we have suggested that whatever resources the State has, it should concentrate first on local authority housing as a method of ramping up the capacity in the building and construction sector. It would have significant side benefits. It is the landlord's job, not the tenant's, to upgrade dwellings. The work has not been done on determining how much is available for this and on how one would ramp it up. The Deputy is identifying an issue that needs further work.

Dr. Kelly de Bruin: Regarding the costs, I agree with Professor FitzGerald. Many of the options needed to reach the targets are cost effective, even without an increase in the carbon tax. Whether we can reach the targets by 2030 will very much depend on how we can incentivise people to make the transfer. This is where the carbon tax is very relevant. I do not know whether the objective is achievable. It depends on what policies are put in place to incentivise behaviour to switch from carbon.

Deputy Lisa Chambers: The carbon tax has been a hot topic of debate at meetings of this committee for some time. Most of us are in agreement that a carbon tax is necessary. We have concerns, however, about pushing people into fuel poverty. The poorest households will be hit the most. Dr. de Bruin said in her opening statement that a carbon tax on its own is quite regressive and hits the poorest the hardest. Interestingly, she spoke about recycling the tax revenue. It is not necessarily a matter of giving it back in a lump sum, whereby a carbon tax would be paid and a cheque would be handed back at the end of the year. It would be a matter of using the carbon tax to offset against income tax or other taxes, thereby reducing emissions and stimulating economic growth, which sounds good.

Professor FitzGerald is obviously a strong advocate of the carbon tax. He has highlighted that former Nobel prizewinners have advocated it as the first and essential step to reducing emissions. What is his council's view on tax recycling? Rather than taking money with one hand and handing it straight back, what is the best way to apply a carbon tax?

Professor John FitzGerald: Our view is that a substantial part of the revenue should be

used to ensure people on low incomes are not worse off but, very possibly, better off. The ESRI paper published last week by Mr. Barra Roantree and a colleague examines a range of options, one showing where all the money is used to increase welfare benefits, which would lead to a significant reduction in poverty. It is up to the committee and the Government to do the sums. Perhaps half the revenue could be used in the way I described, and half in some other way, which would ensure that those on low incomes do not lose out. Options exist but, as a council, we believe it is essential that people on low incomes do not lose out. There is a range of options. That is an issue for the Oireachtas and the Government to decide.

Deputy Colm Brophy took the Chair.

Deputy Lisa Chambers: My final question is for the Department. I am conscious time is running out. The Department has been quiet on the first two questions. I thank Mr. Maughan for presenting his evidence to the committee. I smiled when I read the first page of his opening statement, which suggested there would be quarterly reporting on delivery. I am sure all of us will be looking forward to that. The criticism of yesterday's publication is that we do not have any costings or a clear process for implementing the plan. We have no idea, therefore, how the Department proposes to implement it. It is very much aspirational in parts. It sounds lovely in parts but very expensive. I would like Mr. Maughan's response to what Professor Fitzgerald has said, namely, that it would be nice to have costings. How does he propose to implement the plan? What is his view on how the carbon tax regime should be implemented? I acknowledge that he does not want to dwell on additional revenue that could be raised through the carbon tax but, as a committee, we consider revenue-raising measures, where revenue should be spent and how it can best be used to serve citizens. We very much dwell on where the money will be used. It would be interesting to hear the Department's views on how the carbon tax should be implemented and where the revenue should go. Should it be handed back in a lump sum? Should the tax be recycled? Should it be used to pay off the national debt? This was one suggestion, although I am not sure the latter would have a benefit in the broader sense.

Am I correct that there is a target of 1 million electric vehicles by 2030? Is that even possible given there are fewer than 5,000 currently?

Mr. Frank Maughan: I thank the Deputy. I did not have an opportunity to respond to her first two questions but I will also address them.

I wish to clarify the point I was trying to make about dwelling on the additional revenue. I was picking up on a question in the committee's invitation about the amount of additional revenue that could be raised in increasing the carbon tax. It is a matter of public record in the Tax Strategy Group papers. The figure I provided in my opening statement was €100 million for each additional €500 million raised.

I was asked about the potential use of additional revenue from the carbon tax. As I mentioned, the Department of Finance has issued a consultation paper on this issue. The Department has explicitly picked up on the recommendations of the Joint Committee on Climate Action on the potential options for recycling the revenue, either in terms of a dividend to individuals and households or using the additional revenue to fund specific schemes that could be directed at people at risk of energy poverty, etc. The Department is considering several options and has invited submissions on the matter. I expect that they will be considered as part of the budgetary process in due course and that decisions will be taken on the best approach to adopt to address the recycling of revenue.

I was asked a question about the cost of implementing the plan. It presents the most cost-effective way of reaching our targets for 2030 across all sectors from which there are greenhouse gas emissions.

Deputy Lisa Chambers: How do we know that they are cost-effective, if we do not know the cost?

Mr. Frank Maughan: I am trying to get to the point that the model used in the plan is based on looking across the entire economy and the technologies that can be used. It is based on the marginal abatement cost curve set out in chapter 4 of the plan. It is a matter for the policy design to determine the best way to achieve each of the various targets, including those for the numbers of electric vehicles, retrofitting, etc. From that point of view, the plan does not set out specific costings because there is a policy design phase to come. Part of the approach adopted in the plan and the actions set out in it allow space for the policy design phase. In the plan we are not pre-empting budgetary decisions in terms of how the Government will choose to reach the targets. There are design issues to be followed up on. There are also questions about whether it will be done through expenditure, regulatory or taxation measures. From that point of view, the plan does not set out costings across the board. I indicated in my opening statement that the Exchequer resources available to the Government were set out in the national development plan. That is the extent of the envelope available in terms of resources.

Deputy Lisa Chambers: I want to follow up on that question because I have several points on which I seek clarification.

Chairman: Effectively, the Deputy is out of time.

Deputy Lisa Chambers: Thank you for reminding me.

Chairman: The Deputy can come back in later.

Deputy Lisa Chambers: I certainly will. It is a matter for the Government to decide how it will implement the plan, but the Committee on Budgetary Oversight should know how much it will cost to implement it. For example, how much will it cost to retrofit the current housing stock in the country? How much will it cost to implement a carbon tax? How might it be implemented? These are reasonable questions. How much will it cost the Exchequer if we push people away from using petrol and diesel? That is something we need to do, but there would be a loss of revenue to the Exchequer. These are basic questions that, with respect, Mr. Maughan and his team should be able to answer. The Department cannot publish a plan such as the one that was published yesterday and not have information on costings. That is utterly ridiculous and makes our job impossible. The Government definitely has to decide.

Chairman: The Deputy is over time.

Deputy Lisa Chambers: I have one final point to make about quarterly reporting on delivery. How can the Department report on the delivery of the plan if we do not know how it will deliver it, what the timeline for delivery is and how much it will cost?

Chairman: The Deputy is over time.

Deputy Lisa Chambers: That is a fair question and it has not been answered.

Chairman: I am not saying it is not a fair question but that the Deputy is over time and that she can come back in.

Deputy Lisa Chambers: I have asked the question three times, including before the Chairman took the Chair. How can we assess delivery if we have no costings or do not know the timeline for delivery? We will not be able to say the Department did not meet it because we do not know what it is trying to achieve.

Mr. Frank Maughan: The Deputy asked a question about delivery. The annex to the plan sets out quarterly deadlines for various steps under each of the 183 actions. When we speak about quarterly delivery and quarterly reporting, we are referring to reporting on whether the steps under each of those actions have been delivered or whether there are delays in the steps. That is the way in which the plan will be transparent in its delivery. The various actions, as I have mentioned, address various commitments under the plan for each of the sectors. Each of those actions has detailed roadmaps with specific steps and quarterly timelines. The purpose of the quarterly reporting is to be able to report on and publish whether Departments and agencies are actually meeting the commitments that the plan has set out for them in terms of those steps.

Deputy Richard Boyd Barrett: I thank the different groups for their contributions. I simply do not understand the obsession with the carbon tax being imposed on households. If I understand the testimony given by the ESRI representatives correctly, it seems even though they favour it they acknowledge that it is regressive. Reference was made to a strong trend towards regression. It was stated that low-income households spend a far higher proportion of their income on transport and energy than high-income households. The ESRI also pointed out that more affluent households have higher emissions. That is in page 6 of the ESRI paper. The centrepiece of the Government strategy is to have a regressive tax that will hurt people generating lower emissions who are most vulnerable to the regressive character of that way of approaching it.

I am keen to hear the response from the ESRI on this. I am arguing that it flies in the face of at least some analysis of the application of carbon taxes elsewhere. Notably, Food and Water Watch examined the British Colombia carbon tax. The organisation produced a report arguing that after the implementation of the carbon tax in British Colombia, taxed emissions increased while untaxed emissions decreased. The implementation of carbon taxes on certain emissions did not actually impact. Moreover, insofar as there was an overall slight reduction in emissions, it was more to do with the fact that there was a recession in 2008-09. Where is the evidence? In fact, there is counter-evidence to the effect that imposing what the ESRI seems to acknowledge as a regressive tax on people will not do anything.

Then, I asked myself another question. Where are we looking at the alternatives? All of this has been about carbon taxes imposed on households. Where is the costing, economics and analysis of what the impact would be if we had public transport subsidies in this country up to the level of the highest in Europe? What would the impact on behaviour be if we had free public transport? What would the impact on people using cars as opposed to public transport be if we had 1,000 extra buses in the public transport fleet? I would like to see those data because I wager the impact would be far greater than-----

Deputy John Lahart: What if they were hybrid vehicles?

Deputy Richard Boyd Barrett: What if they were electric? There are serious questions over hybrid vehicles too. Where is the analysis of all these things? Let us suppose we increased current afforestation levels from 6,000 ha per year, which is well below our stated targets, to 10,000 ha per year and the move was based on more sustainable broadleaf forestry models. What would the economic impact be? What would the cost be? What would the benefit be in

terms of carbon sinks and so on? Where is the analysis of all that? It seems heavily loaded in the direction of a particular approach to this that is potentially regressive.

Professor John FitzGerald: When I spoke about the evidence that showed that carbon taxes worked, I said it was exceptionally difficult to find any professional economist who published in an academic journal who suggested anything other than that carbon taxes worked. There are no carbon tax deniers among those who have done economic work. Just as there is evidence that climate change is a huge problem, there is evidence that carbon taxes work. It is true that emissions have continued to increase, even though we have a carbon tax of €20 a tonne. Emissions have increased because the economy has grown. The evidence shows that emissions would have been higher if we had not had a carbon tax of €20 a tonne. The example of British Columbia mentioned by the Deputy takes no account of the other factors that are driving emissions. The Deputy acknowledged that the state of the economic cycle in British Columbia had had an effect. In my previous role as an academic economist, my job was to look at the literature. I note that Dr. de Bruin is nodding in agreement. There is near unanimity that carbon taxes work.

Deputy Richard Boyd Barrett: By the way, that is not the case.

Professor John FitzGerald: On the issue of regression, research dating back to 1992 shows that although carbon taxes are regressive, some but not all of the revenue can be used to compensate people on low incomes to ensure they are no worse off. A paper published by Dr. Barra Rowntree last week shows that such people would be better off if all of the revenue was used to compensate them. That is the evidence. It is up to the Oireachtas to decide how it wants to distribute the income. The net effect of introducing a substantial increase in carbon taxes and using the revenue raised in various ways could be to leave people on low incomes better off, rather than worse off. The climate would be much better off in such circumstances.

Deputy Richard Boyd Barrett: Does Dr. de Bruin wish to respond before I ask a brief supplementary question?

Dr. Kelly de Bruin: I am in agreement with Professor FitzGerald. As economists, the reason we are so focused on a carbon tax is it directly taxes the thing we want to get rid of and is the most effective way to deal with the problem. I accept that if the revenue raised from a carbon tax is not used in an appropriate manner, such a tax is regressive. That is why we have policymakers. They can make policies that counteract the regressiveness. As Professor FitzGerald has pointed out, if half of the revenue is used to reduce other taxes and the other half is used to compensate poorer households, we can get an economic boost from the carbon tax, while fighting the regressiveness of the tax. An appropriate carbon tax policy is not regressive.

Dr. John Curtis: We are not advocating a carbon tax on its own in isolation from the recycling of revenue. The ESRI has made it clear that how the revenue is recycled is important to gain the benefit of the tax. The ESRI has three teams looking at different aspects of the carbon tax. As we published last week in our quarterly economic commentary, one of the teams is looking at whether the revenue should be handed back in a green cheque or targeted at those most in need. It was concluded that even though giving every household back the same amount in a green cheque would compensate for the extra tax, it would be much better to focus the recycling of revenue on those most in need, including the fuel poor. That was clearly demonstrated. It has been suggested we have been entirely focused on the carbon tax, but I do not think we have done that. What are the alternatives? I have spent a couple of years looking at household retrofits. In collaboration with the Sustainable Energy Authority of Ireland, I have looked at

the data for people taking out retrofit grants and how they have responded to such initiatives. Some of the conclusions from that research were taken on board in the plan launched yesterday. For example, it was announced that there would be a one-stop shop to help people to go about retrofits. Even though the grant encouraged people to become involved, we found that people applied for it but did not follow up on it because they encountered difficulties and barriers, for example, when organising tradesmen. The research we have carried out has influenced various aspects of the plan, not just on the carbon tax.

Deputy Richard Boyd Barrett: It is not beyond question that carbon taxes are effective. All the witnesses have done is assert that their effectiveness has been proven by everybody, whoever they are. I cited the example of British Columbia, where the evidence shows that the taxed emissions increased and the untaxed emissions decreased. Rather than this tax being more effective, the opposite was the case. This sort of evidence needs to be scrutinised before we can make blank assertions that carbon taxes are necessarily effective. It has rightly been pointed out that our emissions have continued to climb even though we have a carbon tax. Are we recycling the money that is being generated at the moment so that it has an impact on our emissions? The signs are that we are not doing that, even though a considerable amount is being generated from carbon tax. The witnesses seem to have acknowledged that unless the revenue is recycled in a fair and effective way, it is regressive. The experience is that the receipts from our carbon tax are not being recycled in a manner that is effective or counteracts the regressive impacts of this tax.

Dr. John Curtis: The assertion we are making is based on a considerable body of research, including the ESRI's work and the reports we have put out. The analysis is transparent and has been submitted for peer review. It has been reviewed not just by our colleagues within the institute, but by anonymous peers from universities and the like. Emissions have been increasing. We had a reduction in emissions during the financial crisis when the economy contracted. As Professor FitzGerald indicated, the size of the economy and the population of the country are both expanding. The nature of those increases means we expect a growth in emissions. Professor FitzGerald pointed out that if petrol costs and fuel costs in general were cheaper, we would have more emissions. We have put the evidence out there. The members of the committee and the other Members of the Oireachtas can take it on board.

Deputy John Lahart: Phrases like "carbon tax denial" and "carbon tax deniers" are new ones on me. We will take them from this meeting. It is clear that the witnesses feel strongly about the academic research.

I have a question for the officials from the Department of Communications, Climate Action and Environment. This committee receives documents regularly. It recently received an overview and analysis of major infrastructure projects under the national development plan. Those projects are costed. Some of the costs are overrunning significantly already, even those that are planned beyond 2027. There is a capital tracker for the costing of these projects. The work that was done by the Joint Committee on Climate Action and the Citizens' Assembly fed into the advice given to the Minister by the officials and others. At some stage, the officials must have engaged with the Department of Public Expenditure and Reform on how much all of these proposals would cost over a period of time. I am asking this question from a budgetary oversight perspective. Do the officials have any costings?

Mr. Frank Maughan: As I said earlier, the overall envelope for the resources available for climate action is set out in the national development plan. As the Deputy identified, specific projects are listed in the project tracker published by the Department of Public Expenditure and

Reform. Some of those projects feature in this plan. I suppose the two plans dovetail from that point of view. As I mentioned, this plan does not include specific costings because the approach that is being taken involves setting out what the most cost-effective way of reaching our targets will be. Throughout the various sectors there are sets of targets that can be delivered by the Department of Public Expenditure and Reform-----

Deputy John Lahart: I apologise for interrupting but has a costing been done on a diesel car scrappage scheme to incentivise people to purchase electric cars?

Mr. Frank Maughan: That is a specific proposal. This was mentioned yesterday in questions to Ministers at the launch of the plan. The proposal in the plan is to examine the potential of a car scrappage scheme at this time.

Deputy John Lahart: I have only five minutes and I thank Mr. Maughan for his service. I am not trying to make this personal but there is no costing for that.

Mr. Frank Maughan: The proposal in the plan is to examine the potential of a car scrappage scheme, so right now-----

Deputy John Lahart: There is no costing for it.

Mr. Frank Maughan: ----------

Deputy John Lahart: ---

Mr. Frank Maughan: That is because that analysis has not yet commenced but it is to be delivered, as I understand it-----

Deputy John Lahart: But it is policy.

Mr. Frank Maughan: -----from memory, in 2020. In due course, and through the quarterly reporting, we will have the outcome of that review, and as part of that review-----

Deputy John Lahart: That is grand. There is no costing for it. I am just asking as a member of the Committee on Budgetary Oversight. With regard to the cost of missing targets, as members of this committee we have received a briefing that states the Department of Finance has indicated Ireland is at risk of being subject to fines of €600 million annually from 2021 if targets are not met. It suggests Ireland could be subject to €6 billion in fines between 2021 and 2030. In his contribution, Mr. Maughan has said Ireland is required under EU rules to reduce emissions . Current EPA projections indicate relevant emissions could remain at between 0% and 1% below 2005 levels, which are the levels required, by 2020. This would mean there would be no fines.

Mr. Frank Maughan: The Deputy is talking about the estimates of the potential cost of compliance with reaching our 2030 targets and he has also spoken about the 2020 targets as part of his question.

Deputy John Lahart: Yes.

Mr. Frank Maughan: The costing figures I mentioned were with regard to the cost of compliance with 2020 targets. The estimates with regard to 2030-----

Deputy John Lahart: Let us not move on to 2030 just for a second. If we continue the way we are and do nothing, we will face no fines by 31 December 2020.

Mr. Frank Maughan: We do not face any fines as such. We have purchased a volume of credits to allow us to be compliant with those targets for 2020. As I indicated in my opening statement, we have a requirement to purchase a number of additional credits so we can be compliant with those targets.

Deputy John Lahart: In monetary terms, what are those additional credits?

Mr. Frank Maughan: As I mentioned in my opening statement, there are between €6 million and €13 million of additional costs.

Deputy John Lahart: Where do people get these figures that we face hundreds of millions of euro in fines for missing 2020 targets?

Mr. Frank Maughan: Various estimates have been put out by various parties and sometimes those estimates also include the cost of potential compliance with our renewable energy targets mixed in with our emissions targets, which is a separate framework. There is a separate compliance regime attached to that at EU level. As I understand it, there will be a requirement to purchase compliance with that framework in case there is a shortfall in reaching the renewable energy targets.

Deputy John Lahart: As a layman I ask how much because I do not know the headings or frameworks under which all these fines may issue but Mr. Maughan does. Taking all of the potential liabilities under every heading, if we stood still and did nothing between now and 31 December 2020, what are the potential fines to the country from the European Commission or anybody else?

Mr. Kevin Brady: I will speak briefly on this. Mr. Maughan has spoken about an emission reduction fine of between €6 million and €13 million. We have a 16% renewable energy target and we are projected to reach approximately 13% so we will have a three percentage point shortage. The very large figures the Deputy quoted come from an initial estimate a number of years ago that had a range of between €65 million and €130 million per percentage point, so we would need to multiply them by three. We do not know what the cost of purchasing the statistical transfers from other countries might be. There have been limited trades so far and those costs have been approximately €20 million to €25 million per percentage point. That would give what is very much a ballpark estimate of between €60 million and €75 million for compliance with renewable energy targets. That would be on top of what Mr. Maughan described. I stress that we are basing those estimates on a trade that was done between two particular countries and we do not yet have certainty on it.

Deputy John Lahart: What is the view of the Climate Change Advisory Council and the ESRI on this? How much of a fine do we face by 31 December 2020 if we do nothing?

Professor John FitzGerald: I found the Deputy's question and the answer he received very useful. I am sure that the Department is correct. We are talking about relatively small sums in 2020. We are now looking at 2030, although it might be of less focus to this committee. The Department's answer sounds sensible to me.

Deputy Barry Cowen: That is throwing in the towel in relation to 2020 and Ireland can take its beating.

Chairman: It is not the Deputy's turn.

Professor John FitzGerald: It sounds as though the cost to Ireland of non-compliance will be relatively low, all things considered. That is my assessment having listened to the Department.

Dr. John Curtis: The ESRI has been working on policy measures to achieve compliance. We have not been tracking the whole framework of the different allowances and the market for them. We defer to the Department's better knowledge in this case.

Deputy John Lahart: Why the emergency when we are not that shy of our targets?

Dr. Kelly de Bruin: Because 2030 is coming up.

Deputy John Lahart: I mean in terms of 2020. We will be 21% below the 2005 levels by 2020.

Professor John FitzGerald: Because by failing to meet our 2020 target as a result of our inadequate policies over the past decade, we have an even bigger ask. As I mentioned in my opening statement, even if we meet our 2030 target, the ask after then will become even more difficult. The concern is that we are pushing the issue further down the line. I will be dead before the crisis hits but the Deputy might have more of a problem.

Dr. Kelly de Bruin: The only reason we are almost hitting the 2020 targets is the recession. If it was not for the recession, we would be in much bigger trouble.

Dr. John Curtis: Perhaps the Department will correct me, but those higher figures mentioned by the Deputy for compliance cost were based on a higher emissions trading system, ETS, price and carbon price in the market. That has not come to pass. We have gotten off lightly on the cost of compliance because the market for complying with this has not been as steep as anticipated. However, we anticipate that it will be higher in future.

Professor John FitzGerald: If I may backtrack on costings, the vast bulk of expenditure in heating and transport on meeting the targets set out for the sectors will be undertaken by the private sector. It will be people deciding to buy an electric car because it is the cheap option, providing the carbon price is right. These people would have spent money on a car anyway. On heating, if the carbon price is right, people will spend money on insulating their homes and, in the period to 2050, will be better off as a result. Expenditure and investment will be higher but their outgoings on energy in the subsequent 20 years will be much lower. The issue is that the bulk of expenditure on a spreadsheet will be taken by households deciding on their car and house in a way that will save money; that is on a spreadsheet but behaviour is different. I have done it myself and it saved me a lot of money, but there was also the hassle of doing it. That is where the State needs to target resources. One must give people a push and make it easy. One issue in the plan, which is a reflection of these problems, is how to do it at scale. If I had to go out and find a builder and engineer to retrofit my house, there would be hassle and uncertainty about doing it, whereas if the State managed to push the building industry into developing expertise and ramping it up so that it might come into an estate and offer to do everyone's house at a knockdown price, and the local authority guaranteed it would be done efficiently, there would be much greater take-up. The State needs measures which will give this a push. That is where there is a gap in that further work needs to be done. The bulk of expenditure in these areas will be undertaken by the private sector but State intervention will be needed to give it a push.

Deputy Declan Breathnach: I thank the witnesses for the presentations. I am sceptical, to say the least, about this. Generations of teachers like myself and people generally have been

talking about climate change for 50 or 60 years. We spoke about the possibility of a type of Armageddon if we did not deal with it yet we, the politicians, and the professionals are still grappling with it. Mention was made the other day about the need to reinforce the curriculum. Most people know this has been coming down the line.

I will try to be specific in my questions. Other members have asked some that I wanted to ask but on the implications for revenue of the reduction in oil and diesel as a result of this change, have the witnesses done any calculations on that? Is there a need to climate proof a budget similar to gender proofing to ensure we can have a clear statement of intent?

I said on the previous day when we discussed the Irish Fiscal Advisory Council that nobody likes to pay additional taxes. The reality is that there are some who can afford to do that but there are always those who cannot. We have figures to show that on an annual basis 28% of the population are experiencing fuel poverty, which is a specific concern of mine. Mention was made of 30% or 50% of the carbon tax being returned to them. I would like the witnesses to comment on that.

Dr. Curtis spoke about people not taking up various schemes. Organisations like the Society of St. Vincent de Paul would suggest that community energy advisers should be brought in immediately to lower socio-economic income areas to make those necessary savings. Some local authorities have been proactive on that already. Will the witnesses comment on that and how we can ensure that, in making the transition to a low carbon economy, it is fair and socially just?

I want to make two final points as I will not contribute again. The witnesses spoke about retrofitting, and we hear about the skills and expertise that is needed. Have they done an assessment as to whether that type of manpower is available? I doubt that it is, particularly if our economy continues to grow at the current rate.

Mention was made by Dr. de Bruin from the ESRI that this would have a greater impact on rural areas than urban areas. Has she examined the issue of the need to increase the rural transport system?

Last but not least, in the previous debates on this issue the sceptic in me asked where people will go with the electric cars after the cars' lifetime. It is a simple question. The reality is that the car will be clapped out. There will be no competition. If one buys a car from a particular dealer they will tell one to put it on a scrap heap. The people I speak with who own a diesel or a petrol car and who are struggling will find it very difficult to make ends meet. For anyone who bought a family car for €18,000 or €20,000 in recent years, there is no scrappage scheme that will compensate them in respect of that loss of revenue. We need to cost this properly.

I smiled when Dr. de Bruin spoke about a technical study. In terms of the language used in it, I have said previously that if we want to encourage people who do not understand the need to make these adjustments to understand it, we need to use less difficult language.

That brings me back to those who can afford to make these changes and those who cannot. We need to speak to the ordinary people. I mentioned energy advisers who could help people understand that they can make savings. In the explanations given to date, I do not believe that message has got across to those who need to take corrective action. The witnesses might comment on that.

Professor John FitzGerald: The Deputy asked six questions. On oil and diesel and what will happen once all the transport is electrified, the State will lose €5 billion in revenue. The

Department of Finance has published a paper that is beginning to look at that. It is an issue. It will be a while before the revenue begins to fall off. It will be only when we get the acceptance of electric cars. That will be an issue. In terms of climate proofing the budget, it sounds like a good idea to check what will be the effect of that.

On local authorities and people on low incomes, I believe the State owns more than 100,000 dwellings out of the 2 million local authority dwellings. The State has the duty to upgrade them, not the tenant. Kilkenny County Council did an interesting job on a local authority estate in Kilkenny a number of years ago. Some of the local authority dwellings were privately owned but the council contracted with somebody to put external cladding on and do a job on the dwellings. Those in the privately owned dwellings asked if they could pay and opt into the scheme. I believe this is one of the pilot schemes that would work. There were some problems with the scheme but that is the way to go.

The Deputy spoke about advisers. It is not just people on low incomes. I was talking to three people on very high incomes who do not know where to go for advice. That is an issue, and that is the reason the Department is talking about ramping up and training. The Deputy asked about the staffing available. It is not available. We have a building construction sector that is constrained. The Department knows that. That aspect of the plan needs to be spelled out but it is important that it is being realistic in that we need to do work to develop the supply side.

On the rural versus urban question, a very important paper was produced by Edgar Morgenroth and Richard Tol more than a decade ago. The reason this falls more on rural Ireland than urban Ireland is because of commuters. Barra Roantree had an interesting piece in his paper last week. Farmers pottering around their local area do not clock up much kilometrage but commuters do. The reason we need a carbon tax is to persuade the commuters to be early adopters of electric cars. If they continue to drive a fossil fuel car in 2027, they will be paying a great deal of money for doing that but they will have the option then to drive an electric car to commute to and from work in Galway or Dublin and pay much less for doing so. The rural versus urban issue is related to the commuting, not to the energy use of the household. That is the reason the price needs to be ramped up. It is to persuade commuters to move in this direction.

Also, the national planning framework calls for denser development. In the future, we do not want more people commuting. We will not change the pattern of people who are already commuting but we want denser development to ensure we do not have such numbers of people commuting. One of the issues Deputy Boyd Barrett raised in terms of public transport is that it becomes effective when people live in an urban area. For people travelling into Galway from all over the county, public transport is not an option.

The residual value of cars is certainly an issue. We should remember that cars depreciate by 20% a year. If a person pays €20,000 for a car today, it will be worth €16,000 next year and after three years it will be worth €10,000. By 2030, when we have to move away from driving fossil fuel cars, it will be worth nothing. If a person is buying a car today, he or she needs to be mindful of the residual value of the car and whether that person should buy an electric car. It is that uncertainty which will drive the early adoption of electric vehicles. It will not be because the State will tell people to do it. It will be because people will see the risk of buying a fossil fuel car in 2021, which could be worth nothing in 2027, and may opt to buy an electric one. Those are the factors that will drive change.

Dr. Kelly de Bruin: I want to comment on the relevant topics. The Deputy referred to the impact of diesel and petrol excise duties on revenue receipts. The numbers I gave include that

impact. If we do not recycle the revenue and use it only to reduce the Government debt, the net impact will be negative. If we recycle revenue, that decrease in excise duties will be compensated by an increase in other sales tax receipts and so the net impact will be positive.

On the issue of fuel poverty, Bercholz and Roantree looked specifically at fuel poverty and they found the ten-year increase in the carbon tax would increase fuel poverty by about 1%, but the redistribution scheme can compensate for that.

Mr. Frank Maughan: The Deputy spoke about climate-proofing of the budget. I already mentioned that the plan contains a new commitment on carbon-proofing Government memoranda and individual investment appraisals. That should be strengthened as part of the public spending code the Department of Public Expenditure and Reform is preparing at the moment.

Separately, I believe in last year's Budget Statement the Minister for Finance gave an undertaking to developing green budgeting as part of the budgetary framework into the future. This year's Revised Estimates Volume contains an appendix relating to the individual subheads across Departments that are specifically related to climate action. I understand the Department intends to develop that further in due course.

We acknowledge skills and retrofitting as an issue that needs to be tackled and has been addressed with specific actions under the plan. There are a number of aspects, including the skills base required for retrofitting of buildings to what will be required in the future, which is a very deep level of retrofit considerably beyond what is being done. The need to upskill the existing construction industry is recognised and there are specific commitments to develop accredited courses through the education and training boards to allow that to be done. The upskilling required for the replacement of oil and gas boilers is also addressed in the plan.

The plan also contains a commitment on the development of a rural transport strategy for the Department of Transport, Tourism and Sport.

Dr. John Curtis: The Deputy spoke about community energy advisers and the Society of St. Vincent de Paul. We have discussed some of the research with the Society of St. Vincent de Paul. Community energy advisers are not just needed for low-income households but right across the spectrum. There is a lack of independent advice. We are doing some work with colleagues. People might think they need to replace their windows with double glazing or whatever, but if they had independent advice on what was best for their house, for the same money they might have had a better option. From work we have done we have found households mostly rely on their neighbour, builder or plumber, but with new technology and materials they may not always be best informed.

SEAI has a number of grant schemes. The names can be confusing and they apply to different levels of income. The scheme with the biggest uptake is the Better Energy Homes scheme. It offers a 30% to 35% grant on the cost. That scheme essentially requires people to co-finance the remaining 65% to 70%. In that sense, as a grant scheme it has been very positive, but many people who cannot afford that extra amount are excluded.

Deputy Barry Cowen: As we know, this is a budgetary oversight committee and I do not want to overstep our remit. We all accept our responsibility to ensure budgets provide for and acknowledge the cost implications of meaningful policies to arrest and decrease carbonisation. The Fianna Fáil-Green Party Government began that process by implementing carbon tax in the first place. The failure of Government in recent years has been in not ring-fencing the proceeds

from that to incentivise alternative energy provision, retrofits and so forth.

The Climate Change Advisory Council was to give its opinion on how climate change can be best addressed in the forthcoming budget. Is that correct? It supports increasing carbon tax from €20 per tonne to €35 this year. Is that correct?

Professor John FitzGerald: For next year.

Deputy Barry Cowen: Yes, in the forthcoming budget. It also recommends that the Government make more investment in climate-change actions and that it should lead from the front so to speak. Does Professor FitzGerald believe it is leading from the front when it buys three hybrid buses and 200 diesel ones?

Professor John FitzGerald: In the statement I specifically said that the public expenditure code values the price of carbon emitted next year at €80 per tonne, rising to €260. The buses will be around for 20 years. Based on the amount of damage they will do to the climate over that period and applying the public expenditure code, we would not be buying those kinds of buses.

Deputy Barry Cowen: The ESRI favours incremental increases over a period of time. For example, if it is 80% over the next ten years, it should be 8% per annum. That gives certainty to the budgetary process and gives certainty to the public on the cost implications of them continuing to assist in reducing pollution.

Professor John FitzGerald: It is essential to lay out a trajectory for the next decade. It could be 30% in the budget and 5% a year thereafter.

Deputy Barry Cowen: It is not really leading from the front when it says it will look at it year-on-year and give the public no indication of what the implications will be over the next to ten to 12 years. That is the point the ESRI made. Professor FitzGerald also made the pertinent point that it is regressive in its present format and that needs to be addressed in putting forward a policy or giving a pathway for its increase over the coming years.

Regarding the Department, I agree with Deputy Lisa Chambers that it is a lot of motherhood and apple pie. I come from County Offaly which is Bord na Móna and ESB country. In the 1930s and 1940s the Government of the day was advised to provide a mechanism by which jobs could be created in the region. It was quite successful, thank God, and it provided up to 8,000 jobs at its peak in the 1980s. However, at present it is accelerating its decarbonisation programme. Its workforce has reduced to fewer than 1,000. The public buys into it, strangely enough and thankfully for everybody's sake. The workforce also buys into it. The local authority has set up a transition forum with all relevant stakeholders to ensure the workforce is adequately trained and upskilled to provide alternatives. However, we have not seen the same input, the same effort or the same cohesive and specific targeting of that region by Government. For example, it did not even apply to the last Commission to include the peatlands regions in the EU coalmine transition fund. That failure was recognised by me and another councillor when we went out there last year. We now need to wait for a new Commission to be put in place for the Government to bring forward its application and ensure something is done in the future.

The public is interested and committed to buying into this. However, they need to see the same commitment and buy-in from Government. If they are making a commitment they need to know what they are getting in return. The contents of the plan are so woolly and lacking in specifics that they cannot see what is in it.

Coming back to the remit of the committee and to my responsibility, I hope the Chairman will exclude the answers given to date in calculating those five minutes.

Chairman: I wish to be absolutely clear with the Deputy as I have been with everybody; that is excluded. His time contribution is measured entirely based on when he speaks.

Deputy Barry Cowen: I thank the Chairman. That is all the clarification I wanted. It is very disappointing that there are no costings. We have only come out of a phase whereby we have heard and seen that the children's hospital, within the national development plan, combined with the national broadband plan, add an extra €2.5 billion to the national development plan. We have been told by the Minister that the money will be come from future revenues yet the Irish Fiscal Advisory Council state that is not credible. How credible is it now for this plan to be brought forward even though no proof has been given to us that the national development plan has been climate proofed? The plan was published yesterday but it did not include costings. The plan merely seems to be a reaction to the recent political competition, rather than a meaningful effort to inform the public that it will buy into this project with them, and help, assist and nudge them along. How will people be nudged along? Will people be given an incentive to ensure that the nudge is meaningful?

Mr. Frank Maughan: I have already addressed the question about costings. I want to come back to the point made about the midlands, specifically the suggestion that we have somehow missed the boat when it comes to the application regarding the coal regions in transition. I understand that the discussion is still ongoing with the Commission.

Deputy Barry Cowen: The Commission missed it and said the Department was very late to the table.

Mr. Frank Maughan: The issue is not completely closed off. To clarify, I understand that the discussion is still ongoing with the Commission.

Deputy Barry Cowen: I know that.

Professor John FitzGerald: Deputy Cowen has got his answers.

Deputy Pearse Doherty: I thank the witnesses for their presentations and their attendance. I do not want to belabour the fact that there are no costings. Ironically, this is the Committee on Budgetary Oversight but we cannot do much oversight when there are no numbers in the document. I welcome the fact that we have a plan and realise our views on parts of the plan may differ.

The Department very much backs this plan. Today, however, on the Department's website there is a notice about applications to consent to conduct a survey for fossil fuel companies in the south west and one can see that there have been ten applications since last December. Will the rhetoric in the plan be matched by action? Will the Department change course and stop issuing licences for fossil fuel exploration? We have just spent the last hour talking about how we need to electrify and decarbonise the environment and our transport fleet. Has the Department changed its view of the legislation that seeks to end the practice of drilling for fossil fuels that is before this House? Will the Department continue to oppose the legislation?

Mr. Frank Maughan: There is a Government position on the Bill. The plan that was published yesterday does not change the Government's position. The Minister has been very clear in terms of his perspective on the Bill so I have nothing new to say.

Deputy Pearse Doherty: Perhaps some of the other guests can answer. There has been talk of price signals and all of the rest. What signal do we send to an industry when we say we are open to receiving applications to drill for oil off our coast? These are the same companies. In fairness, Professor FitzGerald has accurately pointed out the level of economists who supported the carbon tax but they are also supported by BP, Shell, Exxon and all the major oil companies. Indeed, the measure is supported in the United States because it focuses on that point. What signal is conveyed when we say we are open to drilling for fossil fuels, while at the same time we put on paper the need to ask individuals? This plan asks individuals to dig into their own pockets and invest in different motor vehicles or to upgrade their homes to do their bit for the environment when the Department overseeing the plan still says we are still open to drilling for fossil fuels?

Professor John FitzGerald: The council has not published on this as yet. I think pumping more oil is not part of the solution to climate change. The one area where there would be a concern is that in the next 20 years, gas will be a significant part of the solution. One example is compressed natural gas for heavy goods vehicles. If one could, for the next 15 to 20 years, switch people in urban areas from using oil to using gas then that would be beneficial. With electricity as the backup supply we will, hopefully, close peat and coal production but electricity production will be very dependent on gas. A secure supply of gas is important if one could separate it from oil. Pumping oil is not a solution for climate change and does the opposite.

Dr. John Curtis: In terms of the merits of future exploration, the ESRI has done a lot of work on the energy sector, particularly the electricity sector and the associated economics. The ESRI, along with engineer colleagues in UCC and UCD, analysed the integration of more renewables and wind energy, and modelled out to 2050. To keep the lights on through that period, and even with a move to net zero carbon, we will need fossil fuels, particularly gas. We may have aspirations for electric vehicles and all the rest but we will rely on fossil fuels for quite a while to keep the economy going.

Deputy Pearse Doherty: How long should the Minister continue to offer major oil companies licences to drill for oil off our shores? The same argument can be made in ten or 20 years time.

Dr. John Curtis: That is true. This is not my area of expertise but the idea that I tried to convey is that we are going to be reliant on them. That is why I prefaced my comments by saying, whatever about the merits of future exploration, we will need that for the near future.

Professor John FitzGerald: There is a technical issue to which I do not know the answer. Can one say one can drill for gas but not for oil? Gas has certain benefits but I cannot see that more oil will benefit climate change. I should clarify that in terms of gas by 2050 there should be net zero emissions and the carbon dioxide produced by burning the gas should be pumped back into the ground, probably into the empty Kinsale gas field. I do not know what the answer is. I am not sure whether one can say one can drill for gas but not for oil. If one cannot do so is one better saying drill for nothing? I would want technical advice on that. We have not considered the matter.

Deputy Pearse Doherty: The Government has set a target of retrofitting half a million homes between now and 2030. That sounds impressive but when one analyses the detail one soon discovers that the figure is only 5,000 more homes per year than was originally laid out in the national development plan. Plus none of the homes, or very few of them, will be deep retrofitted because a B2 rating does not allow for this.

Is the project ambitious enough? Will we need to provide additional incentives to individuals? We hear stuff in the media. People listening to this debate probably do not have a clue. How much would it cost to retrofit a house in Donegal that was built in the early 1980s and bring it up to a B2 or A1 standard? People are scared to do such work because they do not have the necessary money and do not see that supports are available. The supports provided by the Sustainable Energy Authority of Ireland are great if one can afford a portion of the cost and is willing to wait for the savings over the medium and long term. Many people cannot afford to do so. Are additional supports required?

Professor John FitzGerald: We should look to the experience of the Housing Executive in Northern Ireland. I was a member of the Northern Ireland Authority for Energy Regulation in the last decade for four years and during my time the authority undertook two very interesting experiments. One was conducted in Aughnacloy, another was conducted where there had been a major massacre in the previous 20 years, and another one was in a Protestant village. The authority discovered that if one said one wanted to offer the whole village one got much more acceptance whereas if one were a 70-year old, like myself, who lived up the side of a mountain in County Donegal, one would be scared of being burgled, done or whatever. If one provides a scheme on a community basis one is more likely to get buy-in, particularly in rural areas. As I said in Kilkenny, people do not know what is the right thing to do. They may be willing to do the right thing. The Northern Ireland Housing Executive which has a much larger local authority housing stock has experience of ramping up and I want to get some of its people down to talk to us about how to do that. When I spoke to a person at the margins of a meeting, he said the lesson is that one goes in and offer the same for all houses, one does not differentiate. I want to tease out this point. Learning from what has happened elsewhere is the key. In many cases we think we know the best way and we may do things more efficiently, but actually the Northern Ireland Housing Executive is an interesting example which we need to look at.

Deputy Pearse Doherty: I am running out of time. The debate has opened up and there is a focus on the carbon tax. Economists in America signed a letter about the "Green New Deal" to put the focus on carbon taxes, which is supported by also by the industry. It is really a debate about whether we need to be investing and whether the State needs to play a larger role, such as rolling out deep retrofitting, more supports for energy-efficient cars, such as electric vehicles, public fleet or public infrastructure as opposed to just a market solution.

We need to meet these targets but the challenge, as I see it at this point, is that many people simply cannot simply do it. The cost of retrofitting their homes even with State supports is way beyond their means. The cost of buying an electric vehicle is way beyond their means and telling them that they will make so much savings in five, six, seven, eight, nine or ten years is not enough.

Microgeneration is an area where they can get some money to offset some of those costs. Perhaps I can get the departmental officials to focus on the legislation that was drafted by Deputy Stanley two years ago. It passed Second Stage in the Dáil but the Microgeneration Support Scheme Bill 2017 is currently before Dáil Éireann and is being obstructed on Committee Stage by the Government. Yet we see this nice glossy report with no costings but a lot of ambition. How do we take that at face value when there is an obstruction in place to block Bills that will do what some of the measures outlined? Is there a change of heart to the Microgeneration Support Scheme Bill 2017 or will the Government continue to block it?

Mr. Frank Maughan: I will respond to the Deputy's question on microgeneration. My recollection is that the Minister accepted the broad principles of that Bill on Second Stage but

there may have been differences of view on the details of the Bill. The Minister has now come forward with a plan on how he proposes to implement a microgeneration framework in Ireland, which takes account of the need to have a framework that will reimburse householders for the export of excess electricity to the grid. There are a number of design steps to work through in putting that in place, but the Minister is very ambitious to get that in place as soon as possible.

I cannot speak on the detail of the differences that the Minister might have with Deputy Stanley's Bill.

Deputy Pearse Doherty: There is the issue of the "Green New Deal" versus market solutions and the need for the State to step up investment -----

Chairman: Time. Would the Deputy allow time to get a reply?

Deputy Pearse Doherty: If one wants behavioural changes, taxes can work as long as the alternative is within reach.

Professor John FitzGerald: In our reports we have made the point that getting the price right is only the beginning. In order to help people change one needs to have a major range of other policies. The State has a major role in this regard. We are interested in possibly focusing first on local authority dwellings, where the State has the role. How can one drive the development of capacity? If one does it, there are multiple benefits.

There is an issue with infrastructure. Somebody came to see me this morning from County Louth. He drove from Dundalk to Dublin and the charger at the two service stations on the way down were broken. He just got to Dublin and found somewhere to charge his car. It is the responsibility of the State and the regulatory authorities to ensure the roll-out of the infrastructure. The infrastructure must be rolled out in advance. I am not going to buy an electric car unless I know I can get to Kilcrohane, which is as far as one can drive in Ireland, and charge my car. Kilcrohane is even further away than Donegal. The State has the responsibility to make it possible by putting in place the infrastructure. Of course, one has to get the price right but that is only the beginning. We need research. In terms of retrofitting dwellings, we need to know what will work for people.

Another area which is important is getting the incentives right for the State itself. One of my colleagues in the ESRI, Ms Sue Scott did an interesting study in 2003, looking at energy efficiency in the third level and university sectors. Universities had done a reasonable job because they had built a combined heat and power plant because they knew they could get the money back over five years. The institutes of technology were useless - not because they were useless - but because the Department stated that unless one could get the money back within one year, one cannot do it. That was the level of control. The headmaster - who died unfortunately in the past six months - of the school that my children went to 20 years ago, knew I was interested in this and sent me the electricity bills for the school and he showed he had managed to halve the bills but the point for him was that he managed to hide the money from the Department of Education. As he was a woodwork teacher, he used the money to make furniture for the school, which he could not afford to buy.

Deputy Martin Heydon: Thankfully he is gone.

Deputy Pearse Doherty: It is a good job he is no longer here.

Professor John FitzGerald: The State has a role and getting the incentives right even for

the State right is important.

Deputy Martin Heydon: I thank the officials who have come before us. I am really disappointed that Deputy Cowen has had to leave, because in his broad political point-scoring contribution, where he did not ask any questions, I was struck by the fact that different people can look at the same plan and see different things. Deputy Cowen saw a political reaction to recent elections, while Friends of the Irish Environment have called it the biggest innovation in climate policy in 20 years. Who does one believe? I was struck by one of the points made earlier that one of the reason we are close to the 2020 targets was because of the recession between when they were set in 2005 and now. I suppose Fianna Fáil's contribution to climate change was to crash the economy, quadruple the national debt and cause a recession. Just as Fine Gael fixed the massive job losses of that recession, going from 16% to 5% through the Action Plan for Jobs, that is exactly the approach that the Minister for Communications, Climate Action and Environment, Deputy Bruton, now plans to take in a detailed way through this plan, with 183 actions and a quarterly report.

I will not duplicate the questions that were asked earlier. We have a generous regime of taxation incentives to promote the uptake of electric vehicles with VRT relief and the BIK regime and that. Do the witnesses think they are set at the right level or do the rates of taxation incentives for electric vehicles need to be looked at? In regard to VRT and motor tax on private cars, which has been calculated on the basis of CO2 emissions, with higher emissions attracting a higher tax liability, how do they suggest that should be changed to better impact climate action into the future?

Dr. John Curtis: I have worked on the SEAI grant scheme. One of the conclusions in the research reports is that the grant scheme should in essence be changed. We provide grants at present for retrofits on the inputs, for the goods we buy and put into the house and not the outcomes. In a sense the grant should be switched over, so that one gets a grant for how much energy savings or emissions savings one gets, not how much stuff you buy. That refers back to my earlier comments that without the best advice, people were doing the best they could. They were changing the windows when perhaps they should have been upgrading the envelope and so on. However, if one was getting the grant based on the improvement in the outcome, one would force oneself not to make a mistake and to go and get independent advice. That is one area where we could do better on the incentives.

Professor John FitzGerald: The incentives are probably broadly appropriate for the situation we are in today. What is affecting take-up of electric vehicles is, first, the question of whether they will have the necessary range and, second, whether they are cheaper than standard vehicles. Given that the price is falling all the time and the range is improving, the next consideration is whether the infrastructure is in place to make it work. If we put more incentives in place but the cars cannot be charged, we are going nowhere. The next priority, therefore, is getting the infrastructure rolled out.

Mr. Kevin Brady: We consider the incentives in place for electric vehicles to be quite generous. In recent years, we broadened the incentives and made them more generous. For instance, drivers of battery electric vehicles gets a 50% discount on tolls, there are incentives for taxis, and so on. The other key measure we introduced is a grant for home charging. In addition, the climate action fund is supporting rapid charging, and the climate action plan sets out the need to support local authorities with the provision of on-street charging. In the coming years, the focus may shift towards infrastructure as opposed to incentives for the purchase of vehicles. I echo Professor Fitzgerald's point that there are factors we can control and factors we

cannot control. In terms of the supply of vehicles, both the price point and the range are factors we cannot necessarily control. The good news is that we are seeing longer-range vehicles and a reduction in prices. All these factors coming together is very positive, but we absolutely accept that infrastructure must be a key priority for us.

Deputy Lisa Chambers: I will make sure to relay Deputy Heydon's comments to Deputy Cowen, who had to leave the meeting.

Deputy Martin Heydon: I sent an email already, but Deputy Chambers may pass the message on to him.

Deputy Lisa Chambers: It is somewhat comical to hear Deputy Heydon accusing my colleague of political point-scoring while he was engaged in his own point-scoring.

Deputy Martin Heydon: I was just retorting.

Deputy Lisa Chambers: Will the witnesses from the Department indicate what percentage of the climate action plan they envisage being paid for through non-Exchequer funding?

Mr. Frank Maughan: That point was addressed in response to previous questions. Much of the investment that has to take place in the next decade will be private sector investment, including in respect of retrofitting, vehicle purchasing etc. We are talking about hundreds of thousands of consumer decisions which the plan, through its various actions, will try to influence. The broad balance between Exchequer investment and private investment is, as I said earlier, a question for policy design. To come back to the exchange of questions around the electric vehicle incentives, we have a broad set of incentives which are appropriately structured for where things are in terms of the price of the vehicles. As that price comes down over time, the way in which the Exchequer intervenes may also change, as my colleague mentioned. That balance between the Exchequer component and the private component of the intervention must be carefully managed in the coming decade and further into the future to ensure we achieve the targets contained in the action plan. It is not a matter of saying, right now, that for the next 11 years, the balance between private and State investment will be X% and will not change. The balance will necessarily adjust over time.

Deputy Lisa Chambers: Does the Department have plans to cost the action plan and, if so, when will we see those costings?

Mr. Frank Maughan: The way in which the plan is costed will effectively be done through the annual Estimates process. In order to meet the targets assigned to them through the plan, Departments will be expected, in the normal course of the budgetary and Estimates process, to put forward the bids they consider necessary to deliver the targets. Again, that comes back to how the policies are designed. We will see-----

Deputy Lisa Chambers: To be clear, will each Department have certain tasks assigned to it from the plan and will it have to, on an annual basis, seek funding from the Department of Public Expenditure and Reform to deliver those tasks and hope it is successful in its application?

Mr. Frank Maughan: That is correct. The Minister made the point broadly yesterday that this will be done within the framework of the existing Exchequer resources that are available.

Deputy Lisa Chambers: On what date can we expect the first quarterly update?

Mr. Frank Maughan: It is up to the Minister how he proposes to do that. My understand-

ing is that the first quarterly update will refer to the actions for the third quarter of 2019.

Deputy Lisa Chambers: In regard to EU fines, we touched upon the emissions targets. What fines are we facing in 2020 in respect of our renewable targets?

Chairman: That point was comprehensively addressed already, but one of the witnesses may respond briefly.

Mr. Kevin Brady: Rather than fines, we are looking at a statistical transfer purchase from another country. As I described earlier, the estimates we have are based on the trades that have been done. We are at a level of approximately €20 million to €25 million per percentage point. The latest estimates have Ireland dropping three percentage points short, which gives a range of €60 million to €75 million. Again, I stress that this is an estimate based on a trade made between two other countries. We cannot know until any such trade is negotiated and agreed what the cost will be for the State. The figures I gave are very much for indicative purposes.

Chairman: Mr. Brady already answered that question.

Deputy Lisa Chambers: Even if it was asked by somebody else, I am entitled to ask the question in order to seek clarification. With respect, it is not for the Chairman to adjudicate on that.

Chairman: With respect to the Deputy, I have made it clear on a number of occasions in the past that, as is the practice in several other committees, where a question has already been asked of and answered by a witness, he or she does not have to repeat the entire answer. Witnesses may give a clarification where some information is missing, but Deputies should not repeat a question that was fully answered.

Deputy Lisa Chambers: With respect, the Chairman interjected before the answer was given and could not have known what the clarification would be. That is my interpretation of the issue.

Chairman: The Deputy may put her next question.

Deputy Lisa Chambers: My next questions are for Professor FitzGerald. We have been having a debate on agriculture in this committee and outside it. We are an agricultural country, so it makes sense that we have higher agricultural emissions than countries without a large agricultural sector. Given that our agricultural sector is fairly efficient, one of the arguments being put forward is that if we reduce agricultural production in this country, the food will have to be produced elsewhere and perhaps less efficiently. What is the witnesses' view of that argument?

A related hot topic concerns the extraction of oil and gas. Again, the same type of counter-argument arises in respect of the country's energy security. If we are still dependent on those fuels to keep the lights on, what is the witnesses' view on our becoming reliant on another country to meet that demand and our having to import the fuels, which generates more emissions via transportation?

Professor John FitzGerald: Given the focus of this committee, I decided not to focus in my presentation on agriculture. In our annual review report, to be published next month, we are including a chapter concentrating on agriculture. Teagasc has put forward a range of measures in this area. It is our view that we could increase farm incomes and the security of those incomes if farmers producing cattle moved to using the land in other ways. The beef price in

the EU currently is some 30% above the non-EU price. Beef farmers are highly vulnerable to what happens with Brexit. The numbers are already falling and a reduction in cattle numbers would be part of that. We will go into those issues in detail in our report next month.

On energy security, I do not agree, as I said to Deputy Doherty, that there is a security argument for pumping more oil offshore. There may be such an argument in the case of gas, but I would want to examine that because I am not sure we can segment the two.

Deputy Pearse Doherty: The climate action plan includes a target of bringing the price of diesel into line with that of petrol. Is there a timeframe for that? I ask the witnesses for their views on the fuel rebate scheme for the haulage industry in that context. Do they believe it should continue or would it need to be modified and increased to support the haulage sector?

Mr. Frank Maughan: On page 40 of the plan, there is a series of proposals set out in respect of the types of issues that will be examined through the normal tax strategy process, one of which is the question of gradually equalising diesel and petrol excise rates. As the Deputy probably knows, this has been looked at by the tax strategy group for the past number of years. It is almost a standing issue on the agenda of the group. It is subject to political decision, as Deputy Doherty knows, in each year's budget. It must also be seen in the context of the wider issue of rebalancing the entire taxation regime to seek to promote electric vehicles as against either petrol or diesel vehicles. Each of these proposals or issues cannot be taken in isolation. The issue for the Department of Finance will be to find the best balance that addresses the issue of revenue protection while also addressing the objectives we are trying to achieve through the plan, which are to promote behaviour and investment decisions that are going in the right direction from a climate point of view.

Deputy Pearse Doherty: The key question relates to the diesel rebate, which is an important issue in the haulage sector. It was a major point of discussion for the sector in the run-up to the latest budget because there was an anticipation that the Government would equalise diesel and petrol excise rates or increase carbon tax, or, indeed, do both. That would have had an impact on the haulage sector. My question is whether the diesel rebate should continue and, in the view of the witnesses, whether it would need to be modified, that is, increased to support the haulage fleet.

Mr. Frank Maughan: We do not have a particular-----

Chairman: Is that not a policy question?

Mr. Frank Maughan: We do not have a particular view as a Department on that proposal. It is a matter for the Government and the Minister for Finance.

Deputy Pearse Doherty: Does anyone else have a view? In fairness, this is a climate change policy. It is about trying to move people from-----

Chairman: There are very strict guidelines on this. There is nothing to prevent Professor FitzGerald or the ESRI commenting on it but my understanding of the rules by which this committee operates is that departmental officials do not comment on policy. They do not advocate or comment on policy but inform committees on positions that are departmental policy. That is my understanding of the rules. That is the only reason I interjected. There is no problem at all with other witnesses commenting on the matter.

Dr. Kelly de Bruin: I will comment on that, if I may. It is something that we have been con-

sidering in terms of how to compensate the haulage sector without getting rid of the incentive to decarbonise. The problem with the diesel rebate scheme is that participants get money back when they spend it on diesel. It, therefore, has the opposite effect of the carbon tax. We investigated the possibility of not increasing the rebate and giving a production tax reduction to the haulage sector instead to compensate for the increase in carbon tax. If we do that, we can still get emission reductions in the sector while also compensating it for its carbon tax losses. As has been pointed out, this is a policy question. It is important, when considering this problem, to bear in mind that we want to reduce emissions with this increased carbon tax and compensating the haulage sector should not compromise that, if possible.

Deputy Pearse Doherty: It relates to the polluter pays principle as well. Is there an alternative available at this point in time for trucks? There are new standards and vehicles are being built to comply with them but no electric vehicles can take goods from here to France and back again, as far as I am aware.

Mr. John Curtis: There may not be an electric option but Gas Networks Ireland is promoting gas-fuelled vehicles. However, a refuelling infrastructure is still needed. The Deputy's question relates to climate policy in the longer term but, in the short term, most truckers will not have an alternative so they will be forced to pay more. In the longer term, if they are going to use gas or biogas, higher fuel costs might force them to seek out more fuel efficient or carbon efficient vehicles. In the short term, however, the Deputy is correct that there are no alternatives available.

Deputy Pearse Doherty: Can I go back to-----

Chairman: Mr. Brady would like to comment on that point.

Mr. Kevin Brady: I wish to clarify the situation with regard to compressed natural gas. A network of 14 publicly accessible compressed natural gas stations is being rolled out. The first one has opened in Dublin Port. That provides an option for HGV drivers. A commitment has been made by Gas Networks Ireland to roll out a network of 14 stations.

The other point to which Mr. Curtis alluded is that even though gas is a fossil fuel, in future there is the possibility of biogas being produced from anaerobic digestion using food and agriculture waste, injected onto the grid and then used in trucks. In many ways the biofuels obligation that we have for petrol could fund that. It is set out in the plan and we will consult on it in the third quarter.

Deputy Pearse Doherty: There are two elements to the target for electric vehicles. There is a target of 500,000 electric cars by 2030, with the rest being hybrids that use fossil fuels plus an electrical charge. It is not quite the 1 million vehicles headline that we have been hearing about. The target is 500,0000 electric cars on our roads by 2030, with hybrids making up the rest.

Mr. Kevin Brady: There is an important distinction to make here. There are battery-only electric vehicles that can only be fuelled through plugging in. There are plug-in hybrid electric vehicles that have both an engine and a battery. They can be run as full zero emission vehicles if they are charged every night and so on. Then there are hybrid electric vehicles, the most common of which is produced by Toyota. There are more hybrid electric vehicles than most other vehicles. In terms of the targets in the plan, when the term electric vehicle is used, I understand it means battery electric and plug-in hybrid electric vehicles. These electric vehicles are-----

Deputy Pearse Doherty: There is no fossil fuel component-----

Mr. Kevin Brady: With plug-in hybrid vehicles, it depends on driver behaviour. The logic of a plug-in hybrid electric vehicle is that people want to drive electric cars and for commuting to and from work every day, they can use their vehicle in electric mode. Once a month or once a week they want to drive longer distances and-----

Deputy Pearse Doherty: The ranges for those vehicles are only 30 km to 40 km.

Mr. Kevin Brady: They are increasing but they are lower.

Deputy Pearse Doherty: Anyone travelling from here to Monaghan will use fossil fuels in the car.

Mr. Kevin Brady: Yes, one would need a full-battery electric car or-----

Deputy Pearse Doherty: I just sought clarification on that. Dr. FitzGerald referred to incentives earlier and we have advocated an increase in incentives in this area. What do we have at the moment? There are approximately 4,000 electric cars on our roads. Many people want to do the right thing but there are challenges in respect of the infrastructure, certainty and so on. Despite those challenges, people are still purchasing and investing. Not everyone is doing long commutes and so on but these cars are beyond the means of lots of people who want to do the right thing. It was suggested that the current incentives are appropriately priced but given the target we need to reach within ten years, would it be appropriate to increase the bands that are available? The upper limit of the bands under SEAI is €5,000 for a car. The technology is changing, particularly in terms of the range issue which worries lots of people. Next year, the range will be greater and so on but €5,000 for a car that costs €35,000 or €40,000 is not a major support.

Professor John FitzGerald: I can only say that in my choice, which was made three years ago, I went for a hybrid electric car. My next one will definitely be electric, although I hope the hybrid will last. The technology is changing so rapidly that my judgment is, although this is not something that the council has considered, that we should keep the incentives where they are and, within two or three years, it will become the cheaper option for people. My other concern is we will increase the incentives when there are problems in getting cars.

Deputy Pearse Doherty: I wish to make one point. It may be the cheaper option for those who are buying new, but there is a large cohort - the majority - who will never be able to buy and who have never bought a new car because they cannot afford one. They will always buy a second-hand car. Then there are issues with electric vehicles that are being sold on and the supports available in that regard. I am focused on those who want to do the right thing.

Professor John FitzGerald: The Deputy has raised a reaL issue that needs further research. As I have always bought second-hand cars, I can see that it would be interesting to see whether we could speed up the adoption of second-hand cars in some way. There is another issue. If we increase the incentives now, it is difficult to lay our hands on one or two models that are popular. If the supply is fixed, the money will go either to the distributor or the manufacturer. This will be an issue at European level. Will the ramping up of production of electric cars happen sufficiently rapidly or will it simply increase the margin? For that reason, I am nervous about increasing the incentives. The issue the Deputy is raising of second-hand cars is interesting and merits further consideration.

Deputy Pearse Doherty: I have two final points.

Chairman: Mr. Brady wishes to comment.

Mr. Kevin Brady: To give an indication of the numbers, when we include battery and plug-in hybrid vehicles, there are over 11,000 on Irish roads. This year we have had over 2,600 new and approximately 1,200 used electric vehicles imported and licensed in the country. There is a €5,000 grant for the private purchase of a new vehicle, but there is also vehicle registration tax relief of €5,000 that applies to new and second-hand imports. Therefore, the fleet is growing. They are battery and plug-in hybrid vehicles.

Deputy Pearse Doherty: We want to make people do the right thing, but for many the numbers are still tiny. It is still only a small fraction of the figure of 2.7 million vehicles I know that it is moving in the right direction, but are there additional incentives for those who will only buy second-hand models? They will never be able to afford to pay €20,000 or €22,000 for a new car, even with a grant of €5,000. Even that figure is at the lower end, never mind the higher end cost of an electric vehicle.

Mr. Kevin Brady: This is anecdotal evidence, but what we are hearing in talking to those involved in the motor industry, etc. is that there are supply constraints. It is not clear that additional incentives would lead to a significant uptake in the short term. There could be an element of deadweight loss. There are waiting lists for cars. Countries are competing for the limited worldwide supply of electric vehicles. It will be in the middle part of the next decade when price parity will increase the range and supply. That is being viewed as the key point of inflection.

Deputy Pearse Doherty: I want to make a general point before asking one last question. My general point is about the comments made in my absence. The point was made that much of this would come from private sector investment. That is fine and it will involve individual loans and so on. However, there is an absence of detail. The document before me includes no costings. We know about the concept of the new green deal where the State views it as an emergency and there is much talk about what will happen if we miss our 2020 targets. We know that at current levels the cost will be €1.7 billion if we miss our 2030 targets. We also know that the cost of credit is likely to increase. That puts a financial figure on it, as opposed to the cost to the environment and our planet.

What is missing is the ambition of the State. It needs to state we have an issue and that we will roll out retrofitting to every public authority house. What is also missing is real public transport. I cannot take a train from County Donegal to Dublin. The last time a train ran to County Donegal was in 1963. Let us consider the provision of public transport. If it was not for private operators, we would not be able to get from A to B without reliance on a car. These challenges are not laid out in the plan. The fact is there are no costings and that we are going to leave it to each Department to put forward proposals in the Estimates every year. That is not the right way to do it. We should put a cost on it and acknowledge the size and scale of the problem.

Chairman: Is there a question?

Deputy Pearse Doherty: That was my comment. My last question relates to carbon taxes. My question is addressed to Professor FitzGerald. I understand the issue of taxes. One is to raise revenue and the other is to change behaviour. If we want to change behaviour we need to have the option. That is why we argued for the levy on sugar-sweetened drinks to be at a level

that would change behaviour. I have several questions. The first is that the trajectory set out in respect of the report is for carbon taxes to increase to €80 per tonne over a ten-year period. That would allow for a €6 increase per annum. The Climate Change Advisory Council has called for a €15 increase this year. Does the council believe we need to have sharp rises to change behaviour?

The second point is the €20 per tonne levy already brings in approximately €486 million. Is the money in the pot to be redistributed under the hypothecation model to those who want to invest themselves or to help those on low incomes, as the ESRI has pointed out?

Third, I subscribe to many of the points raised by Deputy Boyd Barrett. There is an issue of justice. People need to buy in to not only this part but to every part of the plan and other plans. Sinn Féin has proposals, like Powering Ireland 2030, which are far more ambitious than what the Government has in terms of renewable energy. It proposes a level of 80% rather than 70%. Other proposals need to feed into this mix. Where is the equivalent carbon tax increases on the big polluters and on industry?

The last question I have is for Professor FitzGerald in particular. Can he explain the impact in Sweden, which has the highest carbon tax in the world at €120 per tonne? Sweden introduced that in 1991. Yet, Sweden has only 0.6% of electric vehicles on the roads. While there are high levels of renewable energy, most is hydro-powered energy and that has been in place for decades. There is high reliance on nuclear energy. The figure is 40%. If we want to move people or, as the Government has put it, nudge people along the road, how come high carbon taxes have not resulted in more electric vehicles in Sweden?

Professor John FitzGerald: The first question was on the trajectory. That is for the Oireachtas committee to determine. We will suggest €35 per tonne to suggest the urgency that we have missed out. However, it may well be that sharp rises would be less acceptable. Provided there is a trajectory laid out by the Oireachtas for the future, it should have an impact. If it was €6 per tonne every year, and that was agreed by the Oireachtas with reasonable certainty that it would happen in future, then that is fine. The trajectory over time is important rather than the precise number.

The second point from Deputy Doherty was that €400-----

Deputy Pearse Doherty: I asked about the limits brought in.

Professor John FitzGerald: The question was about hypothecation. I think it probably would be a good idea to put it all together rather than simply state it refers to the increase, because that is too complicated to explain to people. If I was the Minister, I would indicate the full amount of revenue and attribute some of the increases in social welfare to it. I would handle it in that way. That is an issue for the political system rather than for the council, but it could be a good option.

Industry is important. In Ireland 8% of emissions comes from manufacturing. If we add in the electricity consumed, it takes us to a figure of approximately 15%. People talk about taxing industry but one third of emissions come from agriculture and 15% of emissions come from households. The bulk of transport emissions come from households. If we are going to change, it is a question of "We, the people of Ireland". However, in terms of industry, the council has been concerned about the incentives for industry. The bulk of industrial emissions are handled within the EU emissions trading scheme. The EU ETS has produced a price that is too low.

The French Government proposed a carbon price floor which would guarantee a high and rising price, in the absence of the EU emissions trading scheme, ETS, working. Interestingly, the British are the leaders in this and have already done it. Last year the French invited the Dutch and the British Governments to join a coalition in north-western Europe with Germany in doing it. We advocated the Irish Government joining this potential coalition. It is unlikely to happen unless the German Government buys into it. If it does, and we published research in November on why it would be a good idea, it would drive out coal not just here - we are going to close our coal operations anyway - but in north-western Europe. It is already closing coal in Britain. It would be better if the EU's ETS worked better than it does currently because for the rest of industry which is covered by it, the incentives are not high enough to make them change. The problem is that this is not something which is in the remit of the Irish Government. However, the Irish Government has been advocating a much tighter approach at European level. One problem is the fact that the Polish Government is totally opposed to it because of coal mining in that country. The German Government has not bought into the French idea on a carbon price floor so far but the recent election and the changes in the political composition in Germany could see a change. If Germany changes, Ireland should join the coalition, which would raise the price of electricity. The modelling which we have done shows that it would not have a dramatic effect on consumers but it would affect the industrial sector. The industrial sector, that is, big firms are not paying enough and the price should rise. There is a mechanism available to raise the price for some of them but it is up to the EU ETS to raise it for all of them. Even if that happened, the vast bulk of emissions are the responsibility of the people of Ireland, including farmers, householders and so on.

Deputy Pearse Doherty: Could Professor FitzGerald answer the question on Sweden and electric vehicles?

Professor John FitzGerald: I do not know the answer on electric cars in Sweden. Even with a high carbon price and the price of cars coming down so rapidly, it still is not yet time, even in Sweden. Sweden is interesting. There is nuclear power in Sweden. It has nuclear power and for 20 years has been fully integrated with Norway and Jutland, the main part of Denmark. One of the reasons Denmark has been able to have so much wind power is that it is fully interconnected with Norway. If the wind drops in Denmark, five seconds later, water is released from a dam in Norway. Scandinavia, because it has a lot of hydro power and an integrated system, can make much better use of energy and deploy more renewables. In the case of Ireland, with a target of 70% renewable electricity by 2030, we will need an interconnector to France but even that may not be enough. Research done on this previously suggested that we will need a lot more interconnection with continental Europe. It would be cheaper to interconnect with the UK but for obvious reasons, it is not the most reliable partner at the moment. The tradition in Europe is that the costs of interconnection are shared between the two parties which is relevant in the context of an interconnector with France. In terms of our interconnection with Northern Ireland and Great Britain, Irish consumers paid but British consumers paid nothing. If we do a deal with France and the French contribute to it, alongside the EU, it may actually be-----

Deputy Pearse Doherty: Does anyone from the ESRI have an insight into why Sweden, with the highest carbon taxes in the world-----

Dr. Kelly de Bruin: The first thing that one needs to understand is that there are a lot of exemptions in the Swedish carbon tax system for industry as opposed to private consumers. Second, ethanol is extremely popular in private vehicles in Sweden. That is one of the

main contributors to the slower than expected uptake. Furthermore, the distances that Swedish people drive, on average, are much higher than in smaller countries like Ireland. The uptake in recent years has increased tremendously in Sweden because the ranges of the electric vehicles have improved. If one is looking at electric vehicle uptake in Sweden *vis-à-vis* the carbon tax, one must look at the most recent years when the uptake has been much higher. The reason for the delay was that people were using ethanol-powered vehicles in the interim.

Chairman: I am going to allow Deputy Boyd Barrett back in.

Deputy Richard Boyd Barrett: On the purchase of carbon credits to deal with the fact that we are overshooting our targets, is it not fair to say, in language that ordinary people understand, that what we are actually doing is paying for the right to pollute much more than we are supposed to? In that sense, paying for carbon credits to deal with our failure to meet targets is retarding the global effort to reduce emissions. Is that not a reasonable description of what we are doing? In that sense, it is pretty shameful from the global perspective of addressing climate change.

I am also curious about a Government decision about which the departmental witnesses may not be able to say much; perhaps the ESRI representatives might be able to say more. I am shocked at the Government's response - I had to run over to the Dáil to repeat this point to the Taoiseach - to the Petroleum and Other Minerals Development (Amendment) (Climate Emergency Measures) Bill 2018 sponsored by People Before Profit which seeks to keep fossil fuels in the ground. Scientists are saying that 80% of known reserves must stay in the ground if we are going to address the climate emergency. They refer to "known reserves", never mind exploring for more. They do not limit this to oil either. They are talking about known fossil fuel reserves, 80% of which must stay in the ground. The logic of that is that one does not go looking for more fossil fuels and one does not facilitate that search. The Taoiseach's response, in opposing that Bill, was to say that it will not make any difference to emissions. That is a bizarre statement, given what the scientists are saying. The Taoiseach said that it will not make any difference to emissions if we keep fossil fuels in the ground. They cannot both be right. Is it not obvious that if we allow exploration for fossil fuels and they are found, then more fossil fuels will be burned, more emissions will go into the environment and more damage will be done? It does not really matter much whether the fuel is gas or oil. Indeed, I would question the positioning of gas as a transition fuel. The process of producing fracked gas, in particular, also produces a lot of methane. Taken in the round, fracked gas is as damaging to the atmosphere and to efforts to deal with climate change as oil. Surely, paying for and establishing the infrastructure to facilitate gas as a so-called transition fuel is investment that could be going elsewhere. There is an opportunity cost involved in investing in infrastructure for gas and not investing in our universities to develop renewable energy technologies, for example. One comes at the expense of the other.

Chairman: I urge Deputy Boyd Barrett to pose a question.

Deputy Richard Boyd Barrett: Those are questions. They are very clear questions.

Dr. John Curtis: I will start off on the fracked gas. I am not sure if the Deputy said it but it is clearly a fossil gas and not a transition fuel in its own right. The idea of gas being a transition fuel is based on a comparison with using oil or coal, which have higher emissions. If one switches to gas, one is still using a fossil fuel but one is producing less emissions. In the longer term, as my colleagues in the Department said, one builds biogas infrastructure and produce biomethane through taking agricultural and food waste, digesting that to produce biogas and

upgrading it to the equivalent of natural gas. Then one has a net zero-emission fuel.

The Deputy's opening point was that the carbon tax allows one to pay to pollute.

Deputy Richard Boyd Barrett: No. I said carbon credits, not carbon tax. The purchase of carbon credits-----

Dr. John Curtis: Carbon credits have a value, so if a company does not have credits, it ends up buying them. In a way, I supposed, this gives companies permission to pollute in the short term. However, that policy, as Professor FitzGerald stated, has not been successful. The idea of that envelop of carbon credits has been diminishing and is diminishing further . It was like our proposal for the carbon tax, which was to give a long-term vision of when the credits would decline. In other words, a series of increases in carbon tax are announced in order to allow households to adjust behaviour. In addition, it is also announced that carbon credits for industry are going to decrease. The idea was to encourage companies to operate in a less carbon-intensive way.

Professor John FitzGerald: On the Deputy's first question, if one pumps more oil, there will be more emissions worldwide. There will not be less. However, the emissions in Ireland will be unaffected. I presume that is what the Taoiseach meant.

Deputy Richard Boyd Barrett: Is that not a bit disingenuous? Let us be honest.

Professor John FitzGerald: I have given the Deputy my answer.

On the issue of gas, if one looks at the work on how to get to zero net emissions by 2050, that done by the United Kingdom and Denmark - of the ones that I have looked at - is the most sophisticated. The United Kingdom is upping the ante by stating that it will reach net zero by 2050, but that will involve gas-fired generation and pumping the emissions back into the ground. One could not do that with oil because one will not collect the emissions from the exhaust of a lorry or car and pump them into the ground. Gas is a transitional fuel. The Deputy made that point that we do not want to invest in this. In the context of the transition, people should be investing in heat put rather than gas boilers. Investing in a gas boiler is not the way to go, it is a waste of money. In terms of electricity generation, it may well be that we will still have significant gas-fired generation in 2050 but that we will achieve net zero emissions by pumping the gas back into the ground. Some gas may well be part of the solution.

Chairman: I have not yet had an opportunity to offer my apologies. Unfortunately, I had a clashing engagement at the start of the meeting today and that is why I could not be present. I thank Deputy Lahart, who took the chair for the opening part of the meeting.

To follow up on what Professor FitzGerald stated, if the logic is that natural gas will be used in years to come and that emissions will be pumped back into the ground, then there is obviously a benefit to the country in having a natural gas supply, particularly if we are going to use it and can capture emissions by means of the process he outlined. There would obviously be a major cost to us if we had to bring that gas from somewhere else. Effectively, continuing to allow gas exploration is a plus-plus situation.

Professor John FitzGerald: I would not go that far. If we do our job in the context of decarbonising, then the level of gas consumption in 2040 or 2050 will be much lower than it is today. Dr. Curtis is the expert in this area. There would be more biogas. Therefore, some of it will be renewable in that sense. Still, the amount of gas involved, if it is much less than we are

talking about today, and with a European market where there are many different sources, would be bought at a rather similar price by importing. However, the security of supply in having our own source would be beneficial if we were to continue to consume gas. We are probably talking about less gas than we are using today. There is an advantage but in terms of the overall benefits of spending a lot of money on going looking for it off the west coast, I would want to consider that.

Chairman: In even the most sophisticated model Professor FitzGerald has mentioned, namely, that which obtains in the UK, is that built into the thinking of the UK authorities in that regard?

Professor John FitzGerald: Yes. They cannot see, in the light of the available technologies, how one can get zero emissions in electricity without having some flexibility energy sources, such as gas, which can fill in for gaps.

Chairman: Is that a reasonable assumption for Ireland as well?

Professor John FitzGerald: Yes. On the basis of known technologies today, we would be anxious for the Department to lay out the trajectories to 2050 to do what the British and the Danes have done. It is highly likely that if one does so - I refer to the work done by University College Cork on this - a significant part of the solution to getting to 2050 will be gas fired. If one gets to 70% renewables, one will still need 30%. Where one pumps the gas emissions back into the ground, it will be expensive to do so. However, there is research being done on this. We have an empty Kinsale oil field and a pipe that goes out to it so that the possibilities of doing so are there. This is work in progress in terms of research but it is highly likely, on the basis of current known technologies, that part of our solution will be a limited amount of electricity from gas with carbon capture and storage.

Dr. John Curtis: On the benefits of the gas system, the climate action plan possibly includes a measure about no new gas or oil boilers in new houses. Considering Gas Networks has 600,000 households on its network, if one wants all those households to install heat pumps, one has to get 600,000 decisions of individual households to upgrade. However, if one can switch the natural gas over to biogas, although we may not have the capacity for 100% substitution for natural gas, it is essentially a corporate decision by Ireland Inc to produce more biogas and put it into the network. One does not need to have all those 600,000 households make that active decision and put their hand in their pocket. If it were entirely biogas, it would produce zero emissions but it is too ambitious at this stage to talk about that. We have not the capacity in terms of waste, anaerobic digestion and all the feed stocks to go to 100% biogas in the future but there is an opportunity in that regard. In the case of households, we have spoken here about such matters as EVs and retrofits and so on. It is individual households that must make all these changes together. There are many such decisions. The number of individual decisions is up in the millions. That is one where one can hopefully make a corporate decision that might get rid of several hundred thousand individual decisions by households.

Chairman: Is Dr. Curtis saying then that if one could foresee a situation where one could switch from natural gas to biogas, the pressure on households to make that change would be mitigated or offset?

Dr. John Curtis: If we were trying to reduce emissions from households and if households are using zero net emissions fuels, as in biogas, then yes. There is always a benefit then, if they improve the efficiency of the house, from them using less of that biogas and it could go

further. Someone from the Department might be able to say, but I think SEAI has done some assessments of the potential feedstocks that are available to produce biogas. It could be 15% or 25%. It is not an entirety. However, there is much going on, particularly in UCC, looking at opportunities to produce biogas, whether from algae or the sea, or on-source woody biomass. A big opportunity - we spoke briefly about agriculture - is where we may produce low-carbon intensity beef and milk but over half the beef sector is unprofitable. We may be producing low-intensity beef but farmers are not making money out of it. However, the grass they produce to help grow cattle could potentially be a feedstock also to produce biogas.

Mr. Kevin Brady: To talk a bit more about the biogas, the basic feedstocks would be food waste, which would include brown bins etc., but also agricultural wastes or slurries. In terms of the way that gas would go into the network and who would pay for it, there is a cost differential. Producing biogas is more expensive than fossil fuel gas. That is set out in the plan. We want to set a target for it. We have not set a specific target yet because there is more work to do on it, but it is looking at how that could be funded. There are a number of ways that could be done. One way would be an Exchequer fund for injection into the gas grid. Another would be similar to renewable electricity, namely, some sort of public service obligation, PSO, levy. An interesting one would be something similar to the biofuels obligation scheme. Even though we all fill our cars with fossil fuel at the moment, we are not selecting a biofuel or a fossil fuel handle. Approximately 5% of the fuel in both petrol and diesel cars is biofuel and it is placed as an obligation on the suppliers. That takes from the point Dr. Curtis was making about consumer choice. We are not asking drivers to pick the biofuel or the fossil fuel handle. It is an obligation on fuel suppliers. Biogas has been successful in a number of countries but it is a question of how we would support it and increase that biogas into the network.

In terms of the level that could be reached, in the draft national energy and climate plan a level of around 3% of the heat usage in the country was flagged. Gas Networks Ireland is talking about levels of 20% or 30%. There is a good deal of potential in this area, and Ireland has one of the highest potentials for biogas because of our agricultural sector in particular. However, in terms of how we would fund that and put it through, that work needs to be done over the next period.

Chairman: I have to let Deputy Stanley in now.

Deputy Brian Stanley: As Vice Chairman of the Joint Committee on Climate Action I have an interest in today's discussion. I thank the Chairman for the opportunity to allow me contribute. I published a paper on biogas almost two years ago in which we examined what was happening in other countries. The driver behind that was the need for climate action, but what was also in mind was our very large agricultural sector. We are an agricultural country, which is fine, but we have a serious issue with agricultural waste. We are not long back from the EU having pleaded for another derogation on slurry spreading because we are churning it out by the megaton. That is having other environmental consequences in terms of rivers, water quality and so on.

Professor FitzGerald might deal with this question. We have only one plant in the State that injects biogas into the grid. As far as I know it started doing that recently. It was just about to do it the last time I visited the plant, which is more than a year ago. That is pumping into the town of Athy. The injection point is where the Cush Inn used to be, in Kildangan. On the one hand we have this serious problem with agricultural waste. We have a substantial beef industry which produces a very large amount of waste. We have a substantial hospitality industry which produces a very large amount of food waste. If one stands in the plant in Nurney and looks at

what is going in, it is all that type of waste. There are many odours in the area also because there is a pig farm adjoining it but there are not many odours around the plant. There are more than 6,000 of those plants in Germany. We are not Germany but we are a big agricultural producer for a country of our size.

My party, Sinn Féin, published a paper, Powering Ireland 2030, last year. We tried to get the media to take some interest in it but I am afraid we were unsuccessful. Something more important was happening on the day. In that paper we stated that 10% of our energy needs could come from biogas. Mr. Brady referred to 20%, which may be possible over a longer term.

We also have the problem with farm incomes. In northern Italy, farmers have a milk or a beef income but they also have an income from slurry because they are joined together in co-operatives and the slurry is being dried. Rather than having huge tank loads of wet slurry going out and destroying land and land drainage pipes in the middle of winter, and anybody who knows anything about farming will know about that, they simply spread dry fertiliser. They use the anaerobic digestion process in the plant to dry the slurry and pellet it, and it is then sold. They are selling gas and fertiliser and they continue to sell their beef, dairy or whatever.

We have a major problem with farm incomes. If we did not subsidise them, most farmers would go out of business. They cannot survive without the single farm payment and the other range of subsidies.

Chairman: I ask Deputy Stanley to be as brief as possible.

Deputy Brian Stanley: Given those needs and the climate emergency we are in, what is the quickest way of kick-starting that industry? Professor FitzGerald might answer that question.

Chairman: I ask Professor FitzGerald to be brief. Deputy Broughan has just joined us but we were just about to conclude. If we do not we will have to take a formal break. This meeting has been ongoing for three hours and-----

Deputy Thomas P. Broughan: The questions I had intended to ask have probably been asked anyway.

Chairman: Deputy Broughan is very kind. I will allow our witnesses give some brief answers.

Professor John FitzGerald: When it comes to slurry, I defer to my colleague.

Dr. John Curtis: That is the best compliment I have ever received.

Professor John FitzGerald: He is the expert.

Dr. John Curtis: Everything Deputy Stanley said is true. I previously worked with the Environmental Protection Agency, EPA, and one of my work projects was to try to encourage anaerobic digestion for all the areas the Deputy spoke about such as emissions capture, water quality improvements, dealing with waste from the food sector and so on.

The Department has stated that the cost of producing this biogas is more than the cost of fossil fuel at present. If a plant is set up, the cost recovery for profit is not there. Something needs to drive it to make it more cost competitive. One way to do that is through a carbon tax, when the profitability of these plants, versus natural gas production, will improve.

In terms of the sector, I mentioned earlier that farmers in beef production regard it as a vocation. They do not want to move away from what they do but, on average, beef farmers are producing beef at a loss. It is a matter of trying to encourage them to diversify their activities. It is not to stop beef farming but to move into diversification by being energy producers as well. The skeleton in the closet, so to speak, is that 30% of emissions are from agriculture. The real pinch on that sector may come when they have to try to reduce that, but that is a matter for another day.

Chairman: We will let the Department in on the slurry as well.

Mr. Kevin Brady: I will make three brief points. First, the support scheme for renewable heat, the second phase of which opened for applications earlier this month, supports the use of slurry or food waste in anaerobic digestion and the combustion of that gas to produce heat. If a pig or poultry farmer has this waste he or she can put it in an anaerobic digester and combust that gas to use for heat for his or her own use. That is supported under the support scheme for renewable heat.

The second route to market is taking that biogas, cleaning it, upgrading it and putting it into the natural gas grid. That is what we call biomethane. We see two main pathways to that. The first is where it is used in transport. It is similar to the biofuels obligation. We are consulting on this in quarter 3; it is set out in the plan. For instance, compressed natural gas, CNG, trucks, which I mentioned earlier in response to Deputy Pearse Doherty, running on biogas can essentially fulfil a requirement under the renewable energy directive and that cost is socialised across all of transport. In many ways that is one route to market.

The other route is the heat sector. The key challenge in the heat sector is that this gas is more expensive than natural gas. Natural gas might be 2.5 cent at the wholesale rate, whereas biogas might be three times that. Most consumers would not choose to move to that so the question is how we bridge that gap. We also need to answer the question of whether it is a role for the Exchequer. That would involve a large cost over a long period. Is it something that could be fulfilled by a public service obligation, similar to what happens in the electricity sector where we see use of the letters "PSO" on our electricity bills? Could it be considered to be an obligation similar to the biofuels obligation but in the heat sector? This has not been decided, but they are the different funding areas. To be very clear, the barriers to using bio-methane and injecting supplies into the grid are the cost differential and how the cost would be funded, which is key.

Chairman: We have had a long and good three hour session during which the delegates have fielded a lot of questions from a lot of Deputies. We really appreciate the interaction with them. This is part of our work as a committee and it will feed into our deliberations on and input into the budget. I thank the delegates and Deputies for being here.

The select committee adjourned at 4.35 p.m. until 2 p.m. on Wednesday, 19 June 2019.