An Tionól Saoránach The Citizens' Assembly

Paper of

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A paper from Codema – Dublin's Energy Agency addressed to the Citizens Assembly on the topic - *'How the State can make Ireland a leader in tackling climate change'*

Codema would like to thank the Citizens Assembly for the opportunity to submit this paper, which we hope will help the Assembly members with their recommendations to the Houses of the Oireachtas. It is very encouraging to see this topic being discussed on a platform like the Citizens Assembly, and we hope it raises the profile of climate change at a governmental level.

Background

Codema is Dublin's Energy Agency and was founded in 1997 as a not-for-profit limited company. We act as an energy adviser to the Dublin Local Authorities, facilitating energy saving projects, consulting on all low carbon energy developments and, on their behalf, sit as energy experts on a range of Steering Committees. Codema is well networked in Europe and has been successful in bringing European projects on energy and climate change to Dublin with a local implementation for the Local Authorities. We work on projects covering all aspects of sustainable energy including climate change and energy action plans, sustainable renovation, renewable energy, district heating, innovative energy contracting, energy planning, low energy buildings and end-user behavioural change programmes.

The following paper will briefly outline Codema's recommendations, from our 20 years' experience in the energy sector, on what the State needs to change in order for Ireland to become a leader in Climate Change. It will also highlight some exemplar projects that are currently effecting change on the ground in Ireland.

Introduction

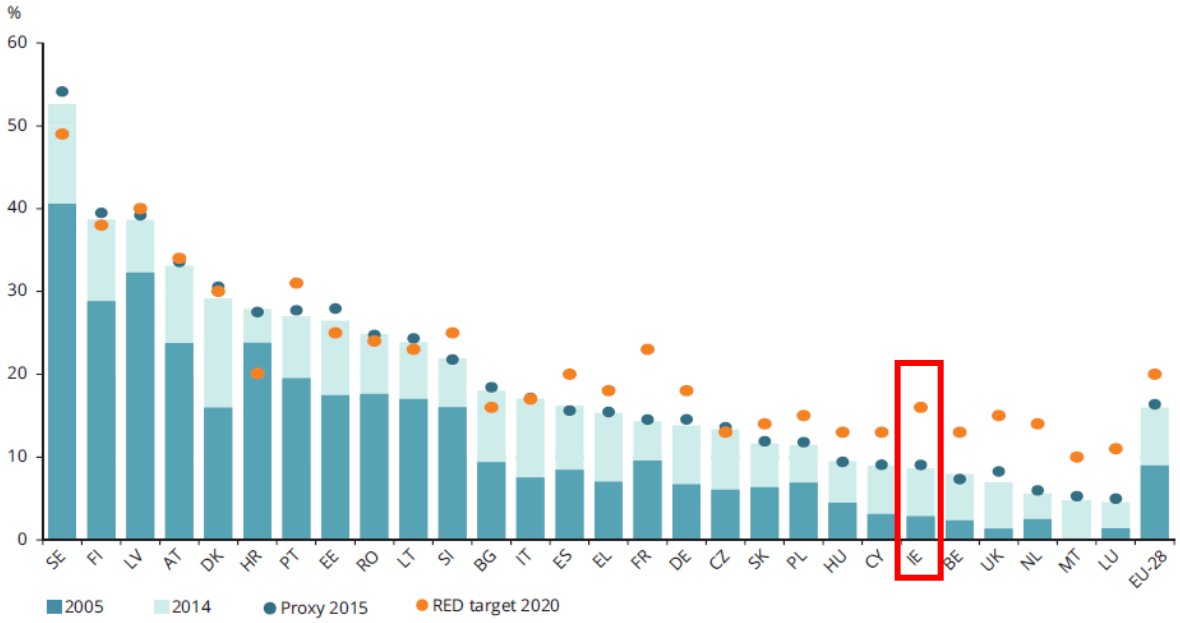
Tackling climate change involves making changes to the current established way of life; how we travel, what we eat, how we build our homes, how we heat our buildings, and how we power our electrical goods. It also requires that we adapt to the impacts that are now unavoidable, such as rising sea levels, increased flooding and extreme weather events. Becoming a leader in climate change requires tough decisions to be made, enacting big changes over a short timeframe which will be disruptive to the current norms and the businesses which rely on those norms. In order to minimise the knock-on effects of these changes, there must be a focus on how the Irish economy can grow and adapt to the changes required. The main change required in the energy sector, the reduction in the use of fossil fuels and the increased use of renewable resources, has the potential to be very positive from an Irish perspective.

Ireland currently imports the vast majority of the fuels used for energy; natural gas and oil for electricity and heating, and petrol and diesel for transport. Ireland has one of the highest import dependencies in Europe, leaving us very vulnerable to changes in fossil fuel markets. By decreasing the use of fossil fuels Ireland decreases this vulnerability, decreases the amount of money leaving the country to pay for these fuels, and increases the use of local sustainable resources, while also reducing Ireland's impact on the climate. Fortunately for Ireland, we have a wealth of resources on our doorstep to produce wind, wave and solar energy and biofuels. Ireland also has many forests and green areas which help to absorb CO_2 and reduce its impact on the environment. Overall, Ireland has all the right ingredients to become a leader in climate change, the only thing required now is the ambition and drive to do so.

What needs to change?

Energy policy in Ireland is currently implemented through a 'top-down' approach, that is, national level programmes and policies are used to effect how energy is produced and what kind of fuels we use in our daily activities. This approach means emissions from energy are tackled at a high level, and these actions have a trickle-down effect on the end-user. The end-user is rarely aware of the policies that are in place and most Irish citizens do not think about where the energy we consume comes from or how much we are consuming (except when it comes to electric immersion heater of course!). Climate change is a difficult topic to grasp, and we are still frequently confused by the many different sectorial energy and emissions targets.

The top down approach has been effective at changing how Ireland's electricity is generated, with Ireland having large shares of renewable electricity in the electricity mix, thanks in large part to wind energy production. But overall, in terms of Ireland's share of renewables in total energy consumption (i.e. all three energy sectors of electricity, heating and transport), we rank far behind our European counterparts, and Ireland is likely to be one of the few countries not to meet the EU 2020 renewable energy and emission targets. Figure 1 shows the share of renewable energy in each country in the EU, with latest figures showing Ireland to have the 6th lowest share in the EU. Ireland is also one of only 5 EU countries to have increased GHG emission levels since 1990[1].



Note: The dark blue bars show the RES shares in 2005. The tops of the light blue bars show the levels that the RES shares reached in 2014. The country codes are defined in Table A3.1.

Sources: EEA; Eurostat, 2016b; RED (2009/28/EC).

Figure 1: EU-28 Countries Renewable Energy Shares (RES) in 2005 and 2014, with Renewable Energy Directive (RED) 2020 target (orange dot). Ireland is highlighted with a red outline *(Source: Eurostat)*

The carbon tax on fossil fuels used for heating is a policy measure to try to encourage the use of renewable heating by making the alternative more expensive and therefore less attractive. Codema's analyses have found that this carbon tax is not high enough to be effective in majority of cases and does not encourage the switch over to renewable heating systems. While renewable electricity is

[1] Eurostat GHG statistics 2017 http://ec.europa.eu/eurostat/statistics-explained/index.php/Greenhouse_gas_emission_statistics

growing, there is still a lot of work to do in the other energy consuming sectors of heating (mainly gas and heating oil consumption) and transport (petrol and diesel consumption). All energy sectors can produce less carbon if looked at together taking a holistic approach and seeing how they can benefit each other within an overall smart energy system.

Exemplar Projects

The following Codema projects are examples of how climate change can be effected by local level actions. There are many such projects being carried out by other energy agencies and local energy communities across the country. In particular, many of these projects are happening through various EU funding streams where Irish participants are learning from and sharing experiences with other leading European cities and towns in the area of sustainable energy. Codema would like to highlight some of our projects to show what kind of actions are taking place and are proven, effective ways for Ireland to start on the path to become a leader in climate change through this local-level approach.

Ireland's First Regional Climate Change Action Plans

Codema is working with the four Dublin Local Authorities to tackle climate change from a bottom-up approach, creating Ireland's first regional Climate Change Mitigation and Adaptation Action Plans. Such action plans empower local actors to contribute toward the national energy goals and the Dublin local authorities, as with all Irish public sector bodies, have been set much more ambitious targets than is currently planned at national level. But not only will the Dublin local authorities (DLAs) aim for a 33% reduction in energy use (and thus it's associated CO_2 reductions) in their services by 2020, all four DLAs have signed, or are in the process of signing up to the Covenant of Mayor's for Climate and Energy Initiative[2], committing to a 40% reduction in CO_2 emissions by 2030, double the national target.

Over the past year the four DLAs have been working together to produce climate change action plans that will set out, not only how they will reach these targets but also how they are planning to adapt to the impacts of climate change that now cannot be avoided. Codema has spent many years developing and mapping the first regional and local baselines for both CO_2 and energy as a first step toward planning for Climate Change. Then, through an extensive process of interviews and workshops with council staff and research into legislation, plans and policies, Codema established actions that the DLAs are undertaking or planning to undertake that can reduce the impact of their activities on the climate and adapt their services to associated risks such as flooding and extreme weather events.

By acting as climate leaders in their own practices and services the local authorities will seek to influence the wider county towards climate resilience. Due to the complex dependencies of climate change, this process will not be easy and will require collaboration on a regional scale between many departments and actors. It will also require commitment from central government to allocate resources to identified actions and place a priority for these in the role for local authorities. The plans will consult with all relevant stakeholders as they are developed, before publication next April.

Effecting change in the home – Home Energy Saving Kits

The Home Energy Saving Kits is a joint initiative between Codema and Dublin City's public libraries and has been running since early 2016. The public can borrow these kits from their local library, and use the six tools inside the kit to get a sense of how much energy they use in their homes every day. The tools include practical items such as a plug-in energy monitor and thermal leak detector, and can help

[2] http://covenantofmayors.eu/index_en.html

identify common issues such as poor insulation and the appliances in the home that might be driving up electricity bills.

Due to its popularity, the scheme was extended in March this year to all of Dublin City's libraries.

The Home Energy Savings Kits are helping Dublin's citizens to take that all-important first step on their sustainable energy journey, by becoming more aware of their own energy use at home, and changing their behaviour as a result. The scheme also highlights the importance of developing climate and energy policies that are citizen and community led, as the kits allow homeowners to become more informed and more responsible in terms of their energy use. A more informed society can make a great contribution to forming more sustainable communities.

The project is also supported by the Sustainable Energy Authority of Ireland (SEAI), which is working with Codema and Dublin City Council to evaluate the impact of the kits on Dublin households. While still in its pilot phase, the vast majority of people that have borrowed a kit from their library have indicated that they have already changed their behaviour at home as a result, and many more are considering energy efficiency upgrades.

If you would like to learn more about the kits please visit: http://www.codema.ie/think-energy-home-hub/the-home-energy-saving-kit/

District Heating – a new way to heat Ireland's towns and cities

District Heating (DH) is an established method of increasing energy efficiency, lowering fossil fuel use, and utilising heat sources that would normally go to waste. A district heating system is much like the electricity system: the energy (in this case hot water) is produced at a centralised power plant or several large plants and fed into the main distribution network (hot water pipes) which transports the energy to buildings for space heating and hot water.

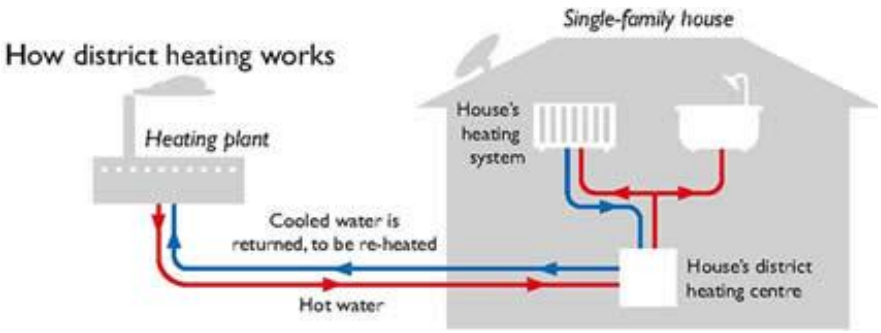


Figure 2 Example of a District Heating system *(Source: Linn-Energy.co.uk)*

DH therefore offers the customer a way to use heat without having a large impact on the environment and with little disruption to their current heating systems. The customers boiler is simply replaced with a smaller DH unit and hot water is piped to the house instead of gas or oil.

In most cases the hot water is produced as a by-product of electricity generation, as there are very large losses involved in the production of electricity in the form of heat. An electrical power plant must get rid of this heat in order to cool down, and if it is not used in a DH system, it has to be is dumped into a body of water like a river, or dissipated into the air in the form of steam. This is what is currently happening in Ireland, with the electricity power plants only reaching a maximum of 55% efficiency. Codema estimates that there is currently enough heat wasted from existing power plants in Dublin to meet nearly half of all the heating demands of the county. If these plants were to produce electricity and utilise the waste heat for a DH system (termed Combined Heat and Power or CHP), the plant's efficiency can increase to 90%. There are also many other sources of heat which can be used in DH systems such as heat from food production like large bakeries, from cement production and fuel refineries, or the heat that comes from large data centre servers like the large Apple and Amazon plants currently being built in Ireland. When a DH system is established all sources of heat can be utilised, increasing efficiency and allowing the sources of the waste heat to earn additional income from the sale of this energy. For example, in a town in Denmark called Aalborg, they even use the waste heat from the local crematorium!

District heating has been successfully implemented in many European countries, particularly in Scandinavia and Eastern Europe. It is also noteworthy that the countries with the highest levels of renewable energy also have some of the highest levels of district heating, as it allows them to integrate more renewable energy into the heating and electricity sector. DH can potentially contribute toward meeting national level targets of energy efficiency and renewable energy in the heating sector in Ireland, but as yet, large scale DH has not taken a foothold in the Irish market. Many expert studies have shown that Ireland is very suitable for DH implementation[3]. Local level stakeholders in Dublin and other cities and towns around Ireland are eager to implement DH. Codema is working with the Dublin local authorities to establish the first large scale systems in Ireland. But this is proving to be a difficult task as currently there is no national level support for the use of district heating, which is something that needs to change.

New ways to contract and guarantee Energy Efficiency savings

In 2016, Codema facilitated Dublin City Council in becoming the first local authority in Ireland to enter into what is termed an 'Energy Performance Contract' (EPC) for the energy-efficient upgrading of three of its largest sports and fitness centres (Ballymun, Finglas and Markievicz). An EPC is a contractual agreement by an Energy Service Company (ESCO), who are experts in energy efficiency, to guarantee energy savings over an agreed period of time. All energy saving measures are designed and carried out by the chosen ESCO and paid for from the resulting savings. Therefore there is no risk to the building owner as energy savings are contractually agreed. If the savings are not realised, the ESCO does not get paid. But if the ESCO performs as expected they get a share of the savings for the duration of the contract.

Typical energy saving measures carried out under an EPC include:

• New LED lighting

[3] Heat Roadmap Europe www.heatroadmap.eu/, Connolly & Mathiesen '*A technical and economic analysis of one potential pathway to a 100% renewable energy system*' (2014), Codema '*Spatial Energy Demand Analysis of Dublin City*' (2014).

• New combined heat and power systems to efficiently heat the swimming pools

• Improved building control systems which will help manage all of the equipment in the centres to ensure that they are working together effectively

Under the contract, the ESCO is also obliged to maintain and, if necessary, repair, the equipment associated with these upgrades; this can lead to significant savings also in maintenance costs for the local authority. The works on the sports and fitness centres were completed in December 2016 and the council is on track to save up to 2.6 GWh of energy per year as a result of the upgrades, with average energy savings of approximately 30% per building. The council is also set to save an additional €70,000 on its energy and maintenance costs per year. A central pillar of the EPC is that these savings are measured and verified on an ongoing basis throughout the lifetime of the contract, which in this example is eight years in total.

This type of innovative energy project can be used in any refurbishment or maintenance contract, particularly in public buildings. Ireland is a completely new market for EPC, and so the main barrier to the development of EPC in Ireland now is knowledge. This can be overcome by the continued promotion of EPC and with local examples of successfully completed EPC projects. One of the keys to success in EPC projects is involving a well-trained, experienced project facilitator, who supports the preparation and implementation of the project on in partnership with the building owner. Codema is currently working with 14 partners around Europe on a European funded project (called GuarantEE) which is focused on the promotion of EPC and the role of the facilitator. As part of this project Codema aims to establish a network of EPC project facilitators in Ireland.

Conclusion

There are many proven ways to effect meaningful change at a local level in Ireland in order to reduce carbon emissions from energy. These projects are happening now across the country in communities, towns and cities led by groups and individuals who are passionate about making Ireland a leader in climate change. These projects and actions are aimed at changing local stakeholder and citizen behaviours when it comes to using energy, which not only reduces emissions, but improves the quality of life of the community and has the potential to improve local and national economies. Codema hopes that the Citizens Assembly can see the value of the work being done and will advise the Oireachtas to support local level initiatives in the bid for Ireland to become a leader in climate change.

The key points from Codema are:

- Supporting local level initiatives not only effects national level targets but engages with citizens in a meaningful way and helps them become a part of the solution
- Local level stakeholders like community energy groups, energy agencies and local authorities can help to effect change from a bottom-up approach
- Local authorities can lead the way by working together and implementing regional Climate Change Action Plans
- Long term planning and tough decisions need to be made at a national level to achieve leadership level in the area of climate change
- Ireland's policy on low-carbon and renewable energy is working well in terms of de-carbonising the electricity grid, but is far behind in the areas of transport and heat
- Transport and heat are local level issues; the decisions on what fuel we use for heating and how we move around our towns and cities are made by individuals locally. Ireland is falling behind in efforts to tackle emissions in these areas and more resources and support for local level initiatives can help this

- Ireland needs to look at all energy sectors together and how they can help to benefit each other to lower emissions in an overall smart energy system; we need to ask how can we maximise the use of our renewable electricity resources and how can we make the best use of our biomass resources to meet our electricity, transport and heating needs - this can only be achieved when local level and national level actions and policies work together.

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