Group 5 - Anna Coghlan, Emma Stewart, Seamus O'Sullivan, Arshad Rehman Mohammed, Kenneth Johnson, John Ryan, Dishant Tekwani

Energy Report

Your group has been tasked with developing a strategy for dealing with the short-term acute energy crisis that Ireland and the rest of Europe is facing. Your brief is to concentrate on measures that could mitigate the crisis for the next three years, with a special focus on the coming winter. Your brief recognises that there are two potential but related problems: first, the risk of interruption in the supply of energy, particularly natural gas; and second, the problem of increased energy costs. Your primary objective is to explore methods of ensuring that Irish residents have supplies of electricity and heating but should also consider the economic aspects of the problem.

(1) Detail your proposed mitigation measures. These measures should be classified into two categories: actions that can be implemented within the next three months (winter 2022/23), and actions that can be put in place for the winters of 2023/24 and 2024/25.

Ireland has a pressing need to deal with the upcoming energy shortage and rising energy costs which are expected due to increased demand in the next 3 months combined with reductions in supply. Because the timeline is so short, we need solutions which can be implemented with existing infrastructure.

Ireland has recently implemented bans on cutting turf. For the time being, these bans should be lifted to maintain energy security. We might also consider using Irish forests as a source of solid fuel. This is ideal because the means to use these fuel sources for energy and/or heat already exist (peat power stations, wood fireplaces/stoves). Furthermore, due to the fact that cutting of turb and Irish forest does not involve importing energy, the price will be lower.

We can also attempt to reduce our energy usage in the short-term - for example by lowering thermostats in public buildings and reducing the use of hot water, and encouraging households to do the same via PR campaigns. There is also a need to promote public transportation, encourage people to walk and cycle, and increase car sharing, as these actions would reduce energy consumption .

In the worst case, energy rationing may be necessary. This may involve caps on the use of household heating, with fines for violations. Attempts to save energy could also be incentivised using a rewards system. Energy would be prioritised for vulnerable groups such as the elderly and vital public services such as hospitals.

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A proposed measure to help reduce the high energy costs for the upcoming winter would be for the Government to consider time-of-day pricing for electricity. The purpose of this is to encourage people to change their energy use to periods when energy costs are usually lower. For example, not putting your dishwasher on in the evening.

It is also necessary in the longer term (winter 2023/24) to secure our energy supply and stop costs spiralling out of control. We have more flexibility in this regard, as there is sufficient time to make some infrastructure upgrades, and explore alternative energy sources.

Ireland should renew the search for offshore oil and gas. This is not desirable in the long term but is necessary to meet our energy needs. However, we should also do whatever we can to increase our supply of renewable energy, e.g., by building more wind turbines.

To deal with the cost of energy, the price of energy should be capped by the government, and means tested subsidies should be doled out. It might also be possible to consider temporary tax measures to raise rates on windfall profits made by electricity companies. And then, those tax receipts should be redirected to electricity consumers to offset higher energy costs.

Another long-term measure to help reduce the risk of interruption of the energy supply would be to introduce energy efficiency improvements in infrastructure and industry in order to reduce gas consumption. In order to achieve this goal, buildings would need to be built with better insulation so that heat can be retained and electricity can be saved.

There is sufficient time to accelerate Ireland's retrofitting programs on time for the winters of the next two years. This will help further reduce energy usage, while ensuring that quality of life is not impacted too heavily.

(2) For each of your proposed actions, identify any risks that could prevent the action being implemented or being effective, plus any further steps that could be take to mitigate these risks

Each of these measures come with a set of risks. Firstly, the use of forests/peat bogs is potentially damaging to ecosystems - particularly in the case of peat bogs, which hold rare species such as certain carnivorous plants. These solid fuels are also worse than oil/gas for air quality.

As a result, the use of these resources should be limited insofar as is possible. Forests which are considered biodiversity hotspots should be left untouched, and peat bogs which have until now remained mostly undamaged should be left alone.

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Reducing the demand for energy by making buildings colder is likely to face opposition, as this is obviously unpleasant. Care should be taken to explain to the public the necessity of these measures, as they are an alternative to more drastic changes, such as rationing.

Capping the price of energy, if done improperly, might reduce the supply of energy. It is necessary to ensure that it is still financially viable for energy providers to supply the country with energy, while ensuring that they do not take advantage of the situation.

Renewed oil and gas exploration will of course increase our reliance on fossil fuels, which is not good from a carbon emissions standpoint. These measures should have a time limit, so that this does not turn into a long term energy source - renewables are still the way forward in the long term.

A risk associated with introducing buildings with energy efficiency improvements would be the costs involved in their implementation, which would pose a threat of the measure costing more than you're saving in the short-term. However, in the long-term this would not be an issue.

(3) In parallel you have been asked to develop a medium to long term strategy for energy provision in Ireland. The overall aims of the strategy will be to: reduce carbon emissions to a minimum, ensure robustness of supply and ensure cost competitiveness. Your strategy should cover all forms of energy usage and should address the issues of energy storage and transport energy demands explicitly.

Our medium term strategy on a large scale involves electrification of the public transport infrastructure, installing our first nuclear fission reactors, making use of our abundant wind through the use of wind energy and implementing tidal energy whilst still maintaining and increasing our gas production.

Electrification of our public transport infrastructure allows us to make use of our cleaner energy as opposed to using diesel or petroleum to power our vehicles. The current train system for example uses diesel and petrol. Using an electric system would allow us to use more efficiently and it's cheaper to operate electric trains than diesel trains. This would allow us to increase our public transport usage, whilst maintaining our current spending on this infrastructure. This is also very valuable as we can then make the transition from car dependent city infrastructure to public transport oriented infrastructure. Whilst not exactly a part of public transport, cycling infrastructure and city planning oriented towards walking and cycling would make the use of cycles more attractive and thus decrease overall energy usage.

We need to produce more electricity ourselves, the 3 main ones are further expansion of our oil and gas fields through exploration, nuclear fission reactors and renewable energy particularly wind energy. As of now the EU considers certain natural gas and nuclear energy plants are now considered to be green energy.

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Ireland has gas fields but we are choosing not to exploit these for environmental reasons. The problem is that we are most likely still going to be using some amount of oil and gas in 10 to 15 years time, and it is better for us to produce our own rather than importing it from abroad. This would allow us to be self-sufficient in our electricity production and be cost competitive.

We also have uranium deposits in Donegal that we should most definitely use in our nuclear program as our new baseload energy supply. Countries like France are already generating a large portion of their electricity from nuclear energy and this has meant that they have been relatively less affected by the current energy crisis as compared to other countries that were dependent on renewable energy or natural gas.

We should also still invest heavily in renewable energy namely wind power and possibly tidal power. This is because through the use of interconnections through European countries we can sell this excess energy to other countries in the EU. As sustainability is increasingly becoming and important issue on the public consciousness, it is important to have a low carbon footprint.

To ensure a long term strategy for energy provisions in Ireland, we suggest investing in new technologies, for example, closed system nuclear energy such as thorium reactors to provide a robust supply of energy to the national grid to meet Ireland's supply. An investment strategy into static and dynamic electric vehicle charging can provide a more renewable transport infrastructure to help to reduce emissions and eliminate energy demands from non-renewable energy sources. Renewable fuels like Hydrogen can be used for electric planes and carbon capture technologies can be used to reduce carbon emissions. Investments into energy storage plants could help provide a redundancy supply of energy for the grid which could help mitigate any risk of power outages. New passive housing developments with smart technologies could increase the energy efficiency from within a household helping to conserve household energy while reducing their carbon footprint.

In order to ensure a robust energy supply in the long term, Ireland would focus on energy localisation and sharing energy between regions. The strategy includes the engineering backed idea that micro grid combinations aid sustainable energy storage solutions. Micro grids would aid localised energy storage and transmittance. Government funding into research and development would see the formation of multi-disciplinary teams. These teams would work together with the aim of achieving micro grids capable of storing, transmitting and sharing energy. The teams would also seek to tackle the issue of both AC and DC current electricity from varying renewable sources being compatible in a grid. In addition to a combination of micro grids, long distance transmittance wires should be constructed. Due to renewable energy's source volatility, the transmittance wires would be used to share and distribute renewable harvested energy across vast areas.