ENERGY SCOTLAND
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Scotland Has The Power

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Introduction

In a recent 18-month study commissioned by the UK Government Department for Energy Security and Net Zero (DESNZ), the large energy consulting companies report stated that Scotland would have the cheapest electricity prices in Europe were we to implement a new electricity pricing structure in the UK electricity market. This is quite a surprise considering the current model of equalising prices across the whole of the UK has resulted so far in Scotland conversely having the most expensive electricity prices in Europe. Changing to a Zonal Pricing model, which is already used by Australia, Sweden, Norway, and Italy isn't an impossible task. Or the Nodal Pricing model (already in the USA, Singapore, and New Zealand) where average wholesale prices in Scotland were modelled to fall from 10p/kWh to only 4p/kWh. Sounds attractive? For Scotland it definitely is, but for the rest of the UK it wasn't completely negative either as both approaches arguably improve decision making on where to locate generation and demand to reduce costs overall. Implementing either of these pricing models would give Scotland the opportunity in one stroke to eliminate fuel poverty, and also create the conditions for a modern-day industrial revolution to take place, attracting as Iceland and Norway already do, large electricity consuming industries such as data centres, aluminium producers - to relocate to Scotland because of our cheap and renewable electricity.

Is this a dream? No. It just so happens that Scotland is an absolute power-house in renewable energy resources, which in the 2020's world currency is a unique selling point.

The Future

In 2023, Scotland produced over 100% of its electricity over the year from renewables. This means that it completely covered its own requirements without the need to produce any carbon emissions and also had some left over to export. The UK government's stretching target for "clean" energy (which includes renewables, biomass, and nuclear) is to reach 95% by 2030. Scotland has met this target every year since 2015. From these figures you can see that Scotland is in a completely different league from the rest of the UK (and almost all of the world) in its renewable resources, and therefore has the ability to easily meet its needs in a sustainable way. As a country we should be proud of this resource, but also be able to benefit from it. At the moment however, as part of the UK - all renewable generation is privately owned and all taxes go to the UK treasury with no credit to Scotland, other than as a small population-sized split as part of the overall UK state. And to cap it all, our power prices are eye-wateringly high.

Is this ability to generate so much renewable electricity the whole story? Well, no it isn't, and it is important that people and also politicians understand why.

The picture of over 100% renewable electricity generation over a full year is compelling, but day to day, half hour by half hour, and second by second the National Grid needs to balance supply and demand. There are plenty of seconds, hours and days where electricity supply from renewables doesn't meet Scotland's demand requirements, even with our already vast wind resources because the wind simply isn't blowing at that precise moment. The solution to this perplexing problem is multiple things, but put simply it is to not put all of our eggs in one "wind" basket. Of course we can and should continue to invest in wind, and to provide exported power to other countries through interconnectors to share our already excess renewable resource, but also importantly we need to diversify

our generation mix. We already have some magnificent large hydro and pumped hydro electricity generating schemes, but we should invest in more. Such projects are already on the table awaiting UK government approval. We also have a huge opportunity to invest in tidal electricity generation, and have world leading resources and companies located here that can do it, but are still awaiting any meaningful UK level commitment. You may notice from this that energy is a reserved matter so all decisions, except planning approval, are taken at Westminster, where history would suggest we are not particularly well served.

Coming back to the technical argument, both hydro and tidal have the advantage over wind that they are more dependable forms of electricity so can be dispatched in a planned way to fill the gap that is created when the wind doesn't blow. We also have the potential luxury of generating "green" hydrogen from excess wind power at times of high wind generation to add to the diverse portfolio, and significant North Sea gas resources to provide more controversial "blue" hydrogen too.

Do we need nuclear as well? No - nuclear is a hugely costly and time-consuming to build and leaves a further multi- £billion negative legacy for future generations that is rarely considered in the economic argument up front. Countries that want to build civil nuclear power stations either need it to produce enriched uranium for nuclear weapons, or to provide power when they don't have any renewable resources. Torness nuclear power station in East Lothian is scheduled for closure in 2030 and beyond that date we simply don't need nuclear power to fulfil our energy (or weapons) needs in Scotland.

However, despite wind, and the opportunity for more hydro, tidal and hydrogen this still leaves a gap in our real time demand-versus-supply equation. In November you may remember we had a whole week of low wind, and therefore little renewable generation, which coincided with cold temperatures and high electricity demand. Fortunately, there was a back-up resource of gas fired combined cycle gas turbines on hand to seamlessly provide the necessary dispatchable power to the Grid. In all probability, these large CCGTs, which apart from SSE's Peterhead power station are all located in England and

Wales, will be required for many years to come to provide the strategic reserve necessary to generate power when renewables are not there.

It would be an option for Scotland to consider building one new CCGT plant to cover these low wind periods and provide a strategic reserve of power generation when absolutely needed. Or we could simply import from England as we do at present on these rare days. Yes, they would generate carbon emissions, however with the objective of net zero in mind, and with a huge positive balance being created with the export of renewables, we are well placed to absorb this.

Finally, with the Grid being increasingly supplied by renewable generation, we should also take the opportunity to build resilience in. The deployment of large grid-scale battery projects in Scotland – currently in planning, combined with the proven technology of new spinning synchronous condensers embedded in the Grid network will provide the low carbon ancillary services needed to ensure resilience and keep power flowing.

To conclude, we need to continue to build out more wind for export, and also invest in a diverse portfolio of technologies to create a more secure supply through changing the investment priority in Westminster. And on the pricing model it would be nice to think that the UK government would take the decision to adopt the nodal or zonal methodology for the whole UK Grid, which would so significantly benefit Scotland's people and kick start our industrial strategy. However, on both these points, let's face it, Westminster aren't going to do us any such favours any time soon, and that leaves the question for Scotland to quite literally take its power into its own hands.