UCD ENERGY INSTITUTE

Eirgrid Tomorrows Energy Scenarios Consultation

The UCD Energy Institute brings together research from a range of disciplines to address research challenges facing the energy sector. We work closely with the energy industry in Ireland and further afield, and have strong collaborations with research institutions nationally and internationally. The EMPowER initiative at Energy Institute focuses on research of particular relevance to public policy. We thank Eirgrid for the opportunity to respond to the *TES* consultation.

Energy systems are undergoing radical change - decarbonisation of power generation and electrification of heat and transport. Eirgrid is tasked with evaluating likely future transmission systems. The TES "credible pathways" to 2040 are informed by climate policy objectives and a range of assumptions about economic growth, demographics, technology adoption. These scenarios are used as inputs for detailed unit commitment simulations and *TES System Needs Assessment*. The TES process delivers important metrics on future system needs, costs, emissions etc.

The 2019 Climate Action Plan addresses national non-ETS emissions reduction under EU Effort Sharing Regulation. It is government's decarbonisation pathway to 2030. CAP is based on the "solid analytical foundation" of a Marginal Abatement Cost Curve. As a comprehensive policy statement, it aims to reduce uncertainty, giving greater confidence to investors and to early adopters of new technology. This can help drive behavioural change.

CAP contains a number of explicit targets including 70% RES-E, numbers of zero-emissions vehicles, number of air source heat pumps, installed offshore wind capacity etc. (Dashboard p. 31, Chapters 7,9,10 CAP). The finalised *National Energy and Climate Plan* to be submitted to the EC in 2019 is expected to follow CAP.

The scenarios outlined in the TES consultation document are imperfectly aligned with CAP. On the demand side, the assumptions of "Community Action" (CA) follow CAP. On the other hand, only the generation side of "Centralized Energy" (CE) is compatible with CAP. These differences may impact system metrics for 2030.

Table 1 TES installed capacities (MW). Values compatible with CAP are in blue.

	CA	CE	DT
Offshore wind	1535	3500	1095
Onshore wind	8200	5124	5848
Solar	1500	400	901

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Table 2 TES 2030 demand (TWh). Values compatible with CAP are in blue.

	CA	CE	DT
Heat pumps	2.67	1.65	1.27
Electric vehicles	4.1	2.68	0.9

For example, Table 2 shows TES annual electric vehicle demand of 1.65TWh in CE. With average consumption of 17.47kWh/100km (TES p.21) and average zero emission km travelled per year of 25Kkm/year (2017 data, Central Statistics Office), CE corresponds to fewer than 400,000 EVs by 2030. As CAP calls for 935,000 zero emission capable vehicles and 550,000 passenger EVs alone, CE is unlikely to be compatible with CAP.

There are two reasons why a scenario that is in better alignment with CAP might be beneficial.

1. There is considerable policy weight behind CAP. It provides an obvious "credible pathway" to 2030. Given the high impact of the climate policies and the need for societal buy-in, scenarios that are consistent with policy are of particular value.

2. Electricity system modelling capability in Ireland is confined to a relatively small number of organisations/research groups. CAP (and NECP) targets will surely be reflected in future studies. Comparison of outputs of these complex models is more valuable when they share similar inputs.

Clearly real-world developments are unlikely to follow any particular scenario or plan precisely. Nevertheless, a modification of the TES to better reflect Climate Action Plan would be of value.

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