

IWEA's Energy Vision came to a similar conclusion, as the initial results from the advanced energy modelling found that the Renewable Energy 2030 scenario is cost neutral for the Irish consumer when compared to the Fossil Fuel 2030 scenario. Figure 3 compares the first cost results of the two scenarios⁴, indicating that the renewable energy scenarios increases the costs for RES Support, Electricity Network Costs, and DS3 Costs, but it significantly reduces the cost of electricity on the wholesale market, capacity in the CRM, as well as the cost for heat and transport. When all costs and benefits are considered, the overall impact on the end consumer is net zero. The most important cost reduction measure to achieve these savings is the declining trend in wind power costs in recent years, which could be replicated in Ireland with suitable policy support. In the IWEA Energy Vision, it is assumed that wind power reduces its costs to ~ €60/MWh, which is conservative compared to the costs reported from other countries (often below €50/MWh), so with suitable policy support it will be possible for Ireland to implement a 70% renewable electricity system without increasing the cost of energy for the Irish consumer.

Ireland is delivering world-leading penetrations of wind power today due to a courageous and ambitious renewable electricity target that was previously set for 2020. Considering the positive impact on Irish society from (DCCA) analysis, IWEA is calling on the Department of Communications, Climate Action, and Environment to show the same leadership once again by setting a target of 70% renewable electricity for the year 2030. If DCCA sets industry this challenge, IWEA believes that Ireland can utilise the world leading skills, experience and expertise built up over the last two decades across academia, system operators, regulators, and the entire renewable industry to help deliver a cost-effective sustainable future for Irish Citizens.

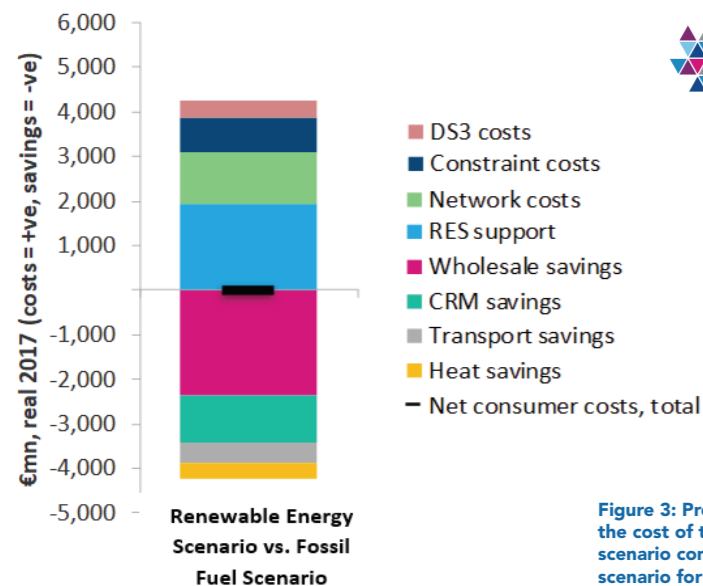


Figure 3: Provisional results outlining the cost of the Renewable Energy 2030 scenario compared to the Fossil Fuel 2030 scenario for the Republic of Ireland.

1 <http://www.eirgridgroup.com/how-the-grid-works/ds3-programme/>
 2 <https://esbnetworks.ie/docs/default-source/publications/esb-networks-innovation-strategy.pdf?sfvrsn=4>
 3 An exact figure will be provided in the follow on detailed report.
 4 https://www.seai.ie/resources/publications/Irelands_Energy_Projections.pdf
 5 www.SmartEnergySystem.eu
 6 <https://www.cru.ie/2017/07/28/post-2/>
 7 A detailed report will follow, so there may be some minor changes when the results are verified

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IWEA ENERGY VISION 2030

IWEA's National Energy and Climate Plan for Ireland in 2030, March 2018



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The Irish Wind Energy Association (IWEA) works with communities, members and stakeholders to lead the transition to a cost-effective sustainable energy system in Ireland with wind at its heart, through policy development, communication and education. Ireland's 2020 energy target of 40% renewable electricity was a key driver in the development of wind power over the last decade. The European Union is currently

negotiating what this target should be for 2030, so IWEA recently undertook a study to investigate if a 70% renewable electricity scenario is possible and affordable in Ireland by 2030. IWEA commissioned the UK's leading Management Consultancy in the Energy & Utilities sector, Baringa, to use advanced energy modelling to analyse two different scenarios for Ireland's energy sector in the year 2030:

TWO SCENARIOS FOR 2030



The **'Fossil Fuel 2030'** scenario where Ireland stops developing renewable electricity after we meet our 2020 40% renewable electricity and as a result rely primarily on fossil fuels to produce electricity in 2030.

The **'Renewable Energy 2030'** scenario where Ireland continues to be a world-leader in renewable electricity, particularly wind and solar power, and reaches a renewable electricity target of 70% by 2030.

THE RESULTS SHOW THAT THE RENEWABLE ENERGY 2030 SCENARIO IS NOT ONLY TECHNICALLY POSSIBLE, BUT IT IS A COST NEUTRAL SOLUTION FOR THE IRISH CONSUMER COMPARED TO THE FOSSIL FUEL 2030 ALTERNATIVE. IWEA'S ENERGY VISION OUTLINES WHAT IS REQUIRED FOR IRELAND TO ACHIEVE A CLEANER, GREENER, AND MORE COST-EFFECTIVE ENERGY SUPPLY WHICH IS BASED ON OUR LOCAL, INDIGENOUS RESOURCES SO IT IMPROVES OUR NATIONAL ENERGY SECURITY WHILE BENEFITING THE ENTIRE PLANET.

To implement the Renewable Energy 2030 scenario, Ireland must continue to be a world-leader at accommodating the fluctuations in wind and solar electricity. IWEA's Energy Vision uses advanced energy models to analyse the type and amount of various technologies that are required for Ireland to be a world leader in this area and enable 70% of electricity to come from renewable electricity in 2030. The input assumptions have been discussed with many leading stakeholders across the energy sector to ensure they are credible and possible to implement between now and 2030. The final mix of technologies are listed in the table below and some of the key measures required to reach a 70% renewable electricity target in 2030 include:

- 1 An increase in wind power from ~4800 MW in 2020 to 10,000 MW in 2030
- 2 Development of 2900 MW of solar power between now and 2030, which includes a mix of small-scale solar on individual buildings and larger ground-mounted solar projects
- 3 An increase in system non-synchronous penetration (SNSP) from 70% in 2020 to 90% in 2030. EirGrid is one of the most advanced Transmission System Operators (TSOs) in the world at accommodating variable renewable electricity so Ireland is already leading the way in this area, particularly via the DS3 programme¹.
- 4 A reduction in the minimum generation production of conventional plants from ~1000 MW in 2020 to ~700 MW in 2030
- 5 An additional 1450 MW of interconnection between 2020 and 2030, which connects Ireland's power system directly to Britain and France
- 6 Construction of 1700 MW of new batteries between now and 2030

Table 1: Key input assumptions for the island of Ireland in 2020 and for both scenarios in 2030.

All Island Numbers	2020 Assumptions	Fossil Fuel 2030	Renewable Energy 2030
% RES-E	41%	37%	70%
Total Electricity Demand (TWh)	40.4	45.9	48.3
Wind Power (MW)	4800	4800	10,000
Solar Power (MW)	320	320	2900
Interconnection (MW)	580	580	2030
SNSP Limit	70%	70%	90%
Min Gen (MW)	1000	1000	700
Electric Vehicles (nr)	0	0	630,000
Heat Pumps (nr)	0	0	396,000
Small Scale Battery Storage (MW)	0	0	500
Large Scale Battery Storage (MW)	0	0	1200

Furthermore, if Ireland continues to develop more wind power in the future, then this renewable energy will not only provide clean power for the electricity sector, but it can also provide renewable energy for heat and transport also. To demonstrate this, IWEA's Energy Vision has also implemented the following:

- 630,000 electric cars are used in Ireland in 2030 instead of petrol/diesel cars
- 396,000 heat pumps replace existing oil boilers in Irish homes by 2030

ESB Networks are already providing excellent leadership in this area by planning for a distribution network than can accommodate these changes². By converting fossil fuel cars and boilers to electricity in the form of electric vehicles and heat pumps, Ireland can use its abundant renewable electricity to replace imported fossil fuels. As a result, IWEA's Energy Vision also increases the renewable energy share in heat and transport, as outlined in Figure 2.

Initial figures suggest that the Renewable Energy Scenario has a Renewable Energy Share of approximately 10%³ more than the Fossil Fuel Scenario due to its contribution in electricity, heat, and transport, which means the IWEA Energy Vision could significantly build on Ireland's 2020 renewable energy share which is likely to be approximately 13%⁴.

There is also a benefit for renewable electricity, as wind power can use the batteries in the electric vehicles and hot water tanks in the heat pumps as storage units, which makes it easier to balance the fluctuations of the wind power. This is referred to as the 'Smart Energy System' concept⁵ (see Figure 2) and it is widely promoted in the latest academic research as an affordable solution for integrating large amounts of renewable energy. Ireland's energy regulator, CRU, is paving the way for this type of energy system with its recent announcement to deliver Ireland's Smart Metering programme⁶.

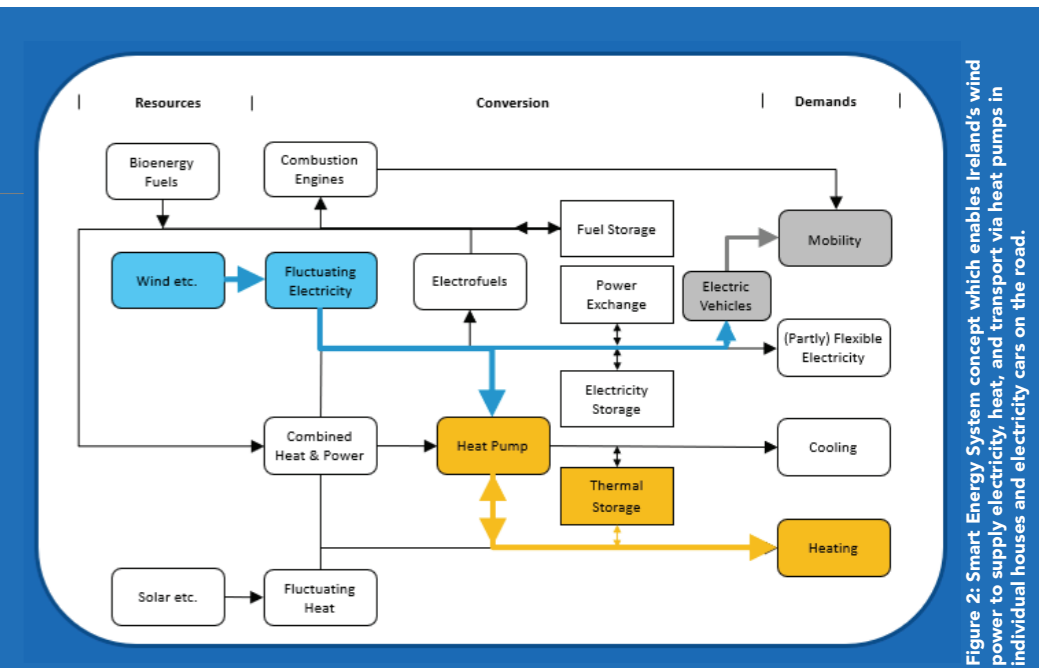


Figure 2: Smart Energy System concept which enables Ireland's wind power to supply electricity, heat, and transport via heat pumps in individual houses and electricity cars on the road.