



**energy
storage**
IRELAND

Energy Storage:

Powering our clean
energy future



www.energystorageireland.com

FROM YOUR PHONE TO THE GRID

Although battery storage projects are fairly new to Ireland, the technology is very familiar and you might be carrying an example of it with you right now.

The rechargeable lithium-ion battery in your smartphone is the same basic technology used in battery storage.

A typical 20 MWh energy storage project would have approximately 40,000 lithium-ion batteries operating together and, like your smartphone, we charge it up and use the electricity as needed.

It is estimated there are more than 3,000 battery storage projects in the world – equivalent to more than 2 billion iPhone 13s – with almost half of them in the United States.

Large amounts of energy storage have also been developed in China and Europe to help cut carbon emissions and reduce electricity prices.

Bloomberg New Energy Finance estimates that the global energy storage market will attract \$620 billion over the next 20 years and we are confident that a small, but growing, amount of this investment will be in Ireland.



Lithium-ion batteries are the dominant technology for reliable, ultra-fast acting energy storage due to their high energy density, long life and excellent safety record. Battery technology is continually improving so that we can continue to deliver critical energy capacity and a host of other services to ensure the reliability of the Irish grid through the energy transition.



Paul McCusker
Vice President for EMEA at Fluence



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CUTTING OUR CARBON EMISSIONS

Battery storage provides essential back-up that helps to keep our electricity supply secure and reduces our carbon emissions.

Traditionally we have relied on fossil fuel generators to provide back-up on the electricity system. Think of it like a car at the traffic lights. It might not be moving but the engine is on and it is still producing the carbon emissions that have created our global climate crisis.

This is a real problem. We cannot operate our electricity system without a back-up but at the same time we must cut our carbon emissions to zero.

This is where energy storage can help.

Instead of using fossil fuel generators as back-up we can use energy storage. We can store power from wind or solar energy and then use it to support the system instead of having to rely on coal or gas.

A December 2019 study by energy experts Baringa showed how battery storage could cut carbon emissions in our electricity system – around 10 million tonnes as of 2021 – by two million tonnes annually.

More energy storage means we don't have to rely on fossil fuels.



Batteries are the buffer the power system needs to absorb, store and strengthen our future electricity system which will be dominated by clean renewables. Without this ability we cannot achieve the power system we want, or the emissions reduction we need.

Dr Paul Deane
Senior researcher with MaREI at UCC

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CUTTING YOUR ELECTRICITY BILL

Energy storage helps to cut your electricity bill.

Every day electricity demand in Ireland starts to rise from about 5pm as people get home from work, switch on the TV or put on the washing. It rises steadily to about 7pm and then starts to fall as people relax for the evening or head to bed.

We call this 'peak demand' because it is when demand for electricity is at its highest. Because demand is so high and the lower-priced generation, like wind energy, is already on the system this means the most expensive generators are now switched on. This drives up the price of electricity.

But energy storage means cheaper and greener power.

This is because energy storage projects typically charge their batteries when wind generation is high and prices are low.

This means during times of peak demand they can provide electricity for less than the expensive fossil fuel generators.



Battery storage provides a dependable, flexible, and affordable alternative to expensive, carbon intensive, fossil fuel-based generators that are needed to supply energy at peak demand. Battery storage systems are managed to ensure they can provide a more efficient market and lower prices for consumers.

Caoimhe Giblin

Commercial Director with electricity trading company ElectroRoute



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HELPING TO KEEP YOUR LIGHTS ON

Energy storage helps ensure a safe, secure, supply of electricity for homes, businesses and farms across Ireland.

It does this by helping to keep your supply of electricity stable. Our electricity system operates at a frequency of 50 Hertz where the amount of electricity being generated must match demand every minute of every day.

If the electricity system is not stable it puts your electricity supply at risk and it can even lead to blackouts.

But energy storage helps ensure you and your family have a secure supply of electricity.

Think of energy storage as the system's back-up. If the frequency starts to change, if a gas power plant shuts down or a power line disconnects, then energy storage can be used to stabilise the system.

A lithium-ion battery, for example, can respond in milliseconds to balance the system and to help ensure the system stays secure.



Batteries are a vital part of system stability. Today, we are capable of running the system at 75% renewables. We would not be able to do that without batteries. They are a critical part of the overall solution.

Mark Foley
CEO of transmission system operator EirGrid

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PLANS FOR IRELAND

We cannot decarbonise Ireland without first decarbonising our electricity system. And we cannot eliminate carbon from our electricity supply without energy storage.

In 2021 energy experts Baringa estimated that to hit the 80 per cent renewable electricity targets in Ireland and Northern Ireland by 2030 we would need at least 1,700 MW of battery storage on the island of Ireland.

Every battery storage project connected makes our electricity grid more secure and helps to integrate wind and solar power.

Today, in May 2022, we have 13 projects operating with a combined capacity of 500 MW and we expect this to grow rapidly to nearly 800 MW by 2023.

There are nearly 60 more battery storage projects – 2,500 MW – in development on the island and we are confident of delivering on our 2030 targets.



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INTERVIEW WITH **BOBBY SMITH** HEAD OF ENERGY STORAGE IRELAND

Can you give us an example of how battery storage helps the Irish electricity system?

On 21 May 2021 the frequency of the Irish electricity grid, which needs to be maintained at a rate of 50 hertz to ensure we can all have a secure supply of electricity, dropped to 49.8 hertz for 14 minutes.

This might not sound like a lot but for an electricity system that's a big drop over a very long time and, if it continued to fall, we would absolutely have seen blackouts.

How did energy storage help?

As soon as the frequency hit 49.8 hertz battery storage projects located around the island responded. In 180 milliseconds they went from providing no power to operating at their maximum. This helped to stabilise the electricity system and bought time for the grid to be restored to the right frequency.

What would have happened without batteries?

The electricity grid would have very quickly become very unstable. EirGrid and SONI, the transmission system operators, would still have had some emergency options but if they had failed then the frequency would have continued to fall and we would have seen a loss of power to parts of the island.

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