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Ensuring Resource Adequacy with Increasing System Variability

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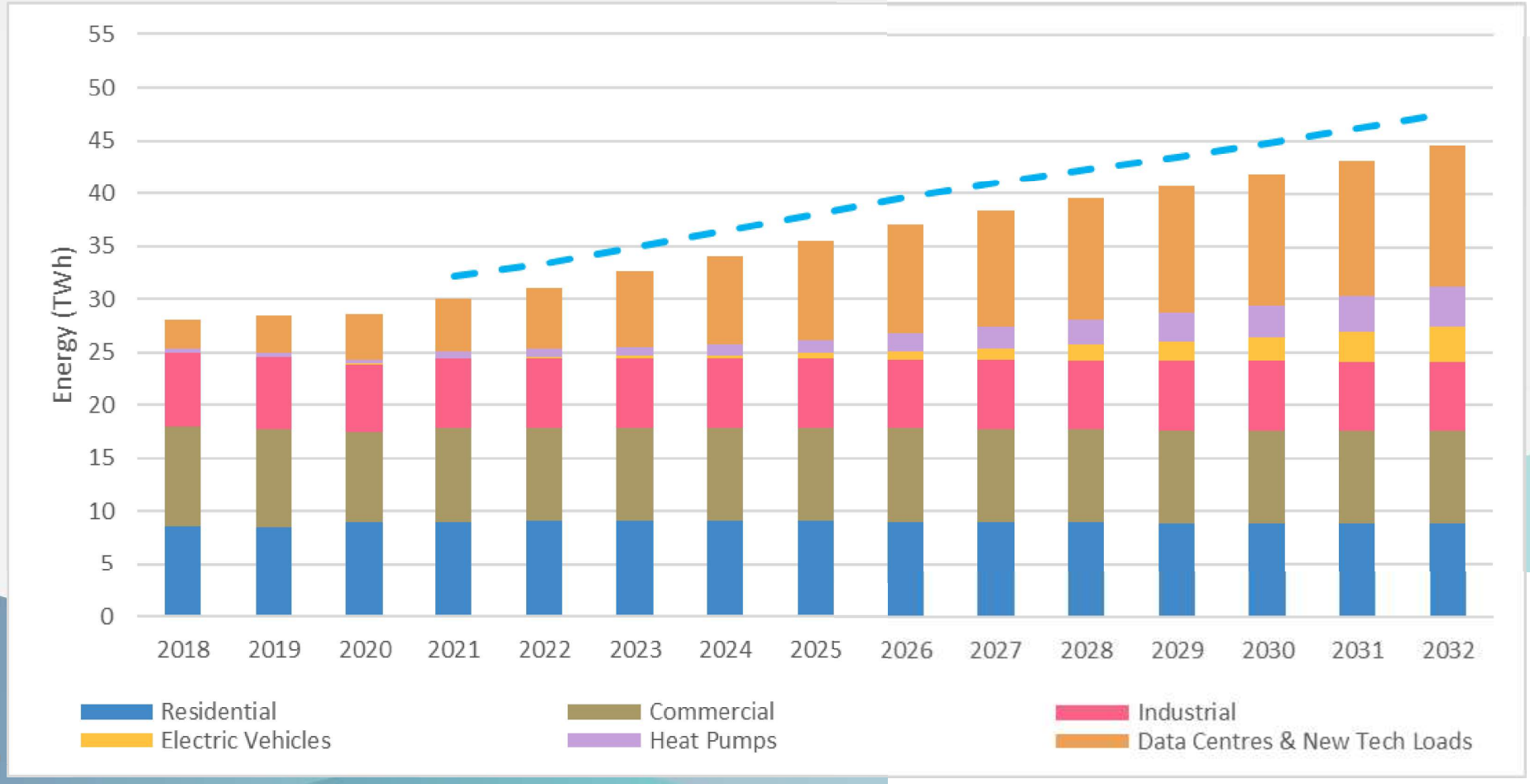
Department of Climate, Energy and the Environment

9th September 2025

Ireland's Electricity Demand Projections to 2032



Ensuring Sufficient Resource Adequacy and System Resilience during Challenging Periods

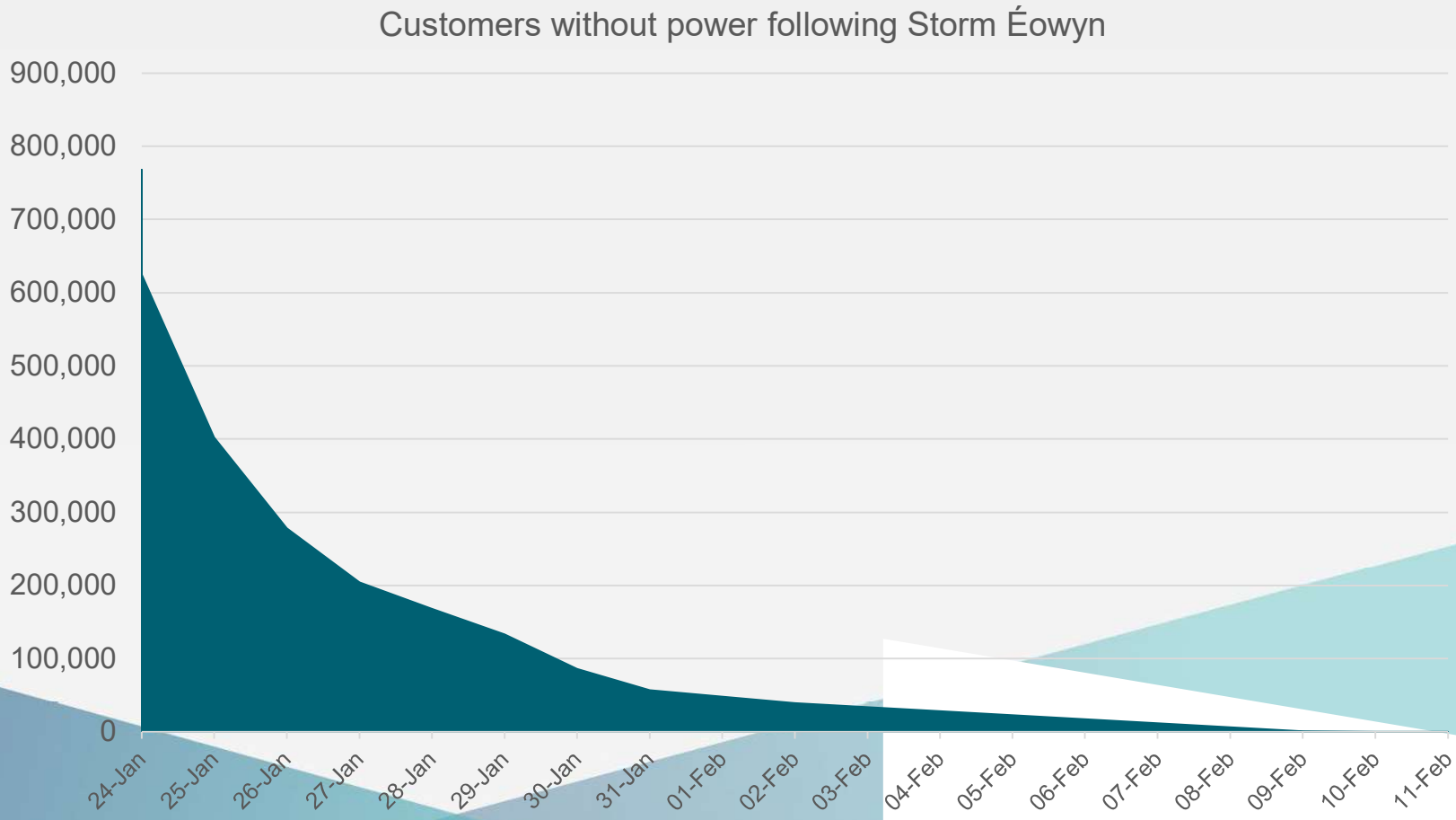
Unique Qualities of Ireland:

- We must ensure that we maintain resource adequacy to meet the needs of a growing high-tech economy.
- IE has one of the highest electricity demand profiles from data centres in the world;
- an expanding population; and
- increasing levels of electrification across society

Resilient Systems:

- The impacts of climate change mean we must also build more resilient systems to ensure uninterrupted energy supplies, particularly as a changing climate brings new challenges, which require new investments to protect critical energy infrastructure and ensure resilience.

Resilience: Storm Eowyn, a record breaking storm cut power to nearly a 1/3 of country, taking 3 weeks to restore.



From ESB repair works data

Gas for Flexibility and Backup

- While IE increased share of variable renewables, **greater reliance on gas** to provide sufficient flexibility and backup.
- Energy system must be able to withstand major disruptions, e.g**. undersea pipelines.**
- **41%** IE's gross electricity supply came from natural gas in 2024.

Gas: Risk Mitigation

- Programme for Government 2025, **Securing Ireland's Future**, commits to taking all necessary action to ensure and protect IE's energy security.

- While gas demand is expected to increase over the coming years as we transition to renewables, as increased renewables come on board, overall gas demand is expected to decline late from 2020s on.

- DCEE is implementing a package of measures to ensure a greater gas security of supply under **Energy Security in Ireland to 2030**.

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System Services: Delivering a Secure, Sustainable Power System (DS3)

- To operate grid using increased volumes of **variable** renewable electricity, system operators need increased amounts of 'system services' to ensure grid stability.
- These services are essential to overcome technical challenges.
- IE has procured significant volumes of system services to safely and securely operate a highly renewable grid through its DS3 system services program.

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Electricity Storage Systems

- Currently 1.2GW electricity storage systems on the all-island electricity grid.
- Funding mechanisms, ‘Route to Markets’ incentivize deployment of electricity storage systems capable of providing specific services to the grid known as ‘Bulk Electricity Time-Shifting’ (BETS) and Demand Flexibility.
- Eirgrid and ESB Networks developing 2 Route to Markets to incorporate 500MW electricity storage each to grids.

Large Energy Users (LEU)

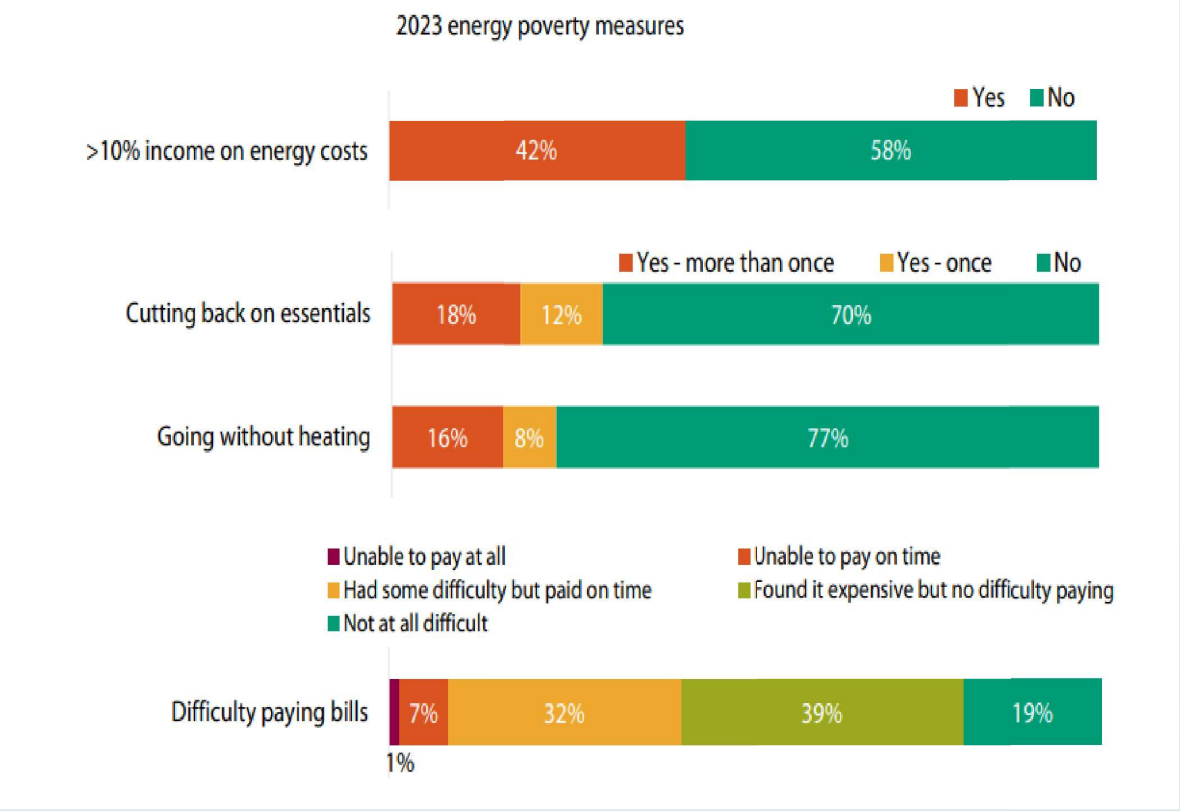
- A unique challenge for Ireland is the growing demand for electricity from large energy users, particularly data centres which account for more than 20% of Ireland's electricity demand.
- With changes in grid frequency and temporary faults, LEU disconnect from grid and switch on back-up generators.
- The resulting rapid loss in significant demand load causes fluctuations on electricity grid.
- System security events even more challenging to manage. As more LEU come online, fluctuations grow in size - resulting in more blackouts.

Working together with LEU to find Solutions

- It is important that LEU are part of solution to balance a highly renewable grid.
- LEU can help reduce demand at peak times and benefit from periods of high renewable generation.
- Learning from each other on how to manage these emerging risks is crucial in ensuring grid stability.
- By ‘riding through’ any grid issues, LEU can work with grid operators to protect their equipment and ensure grid stability.

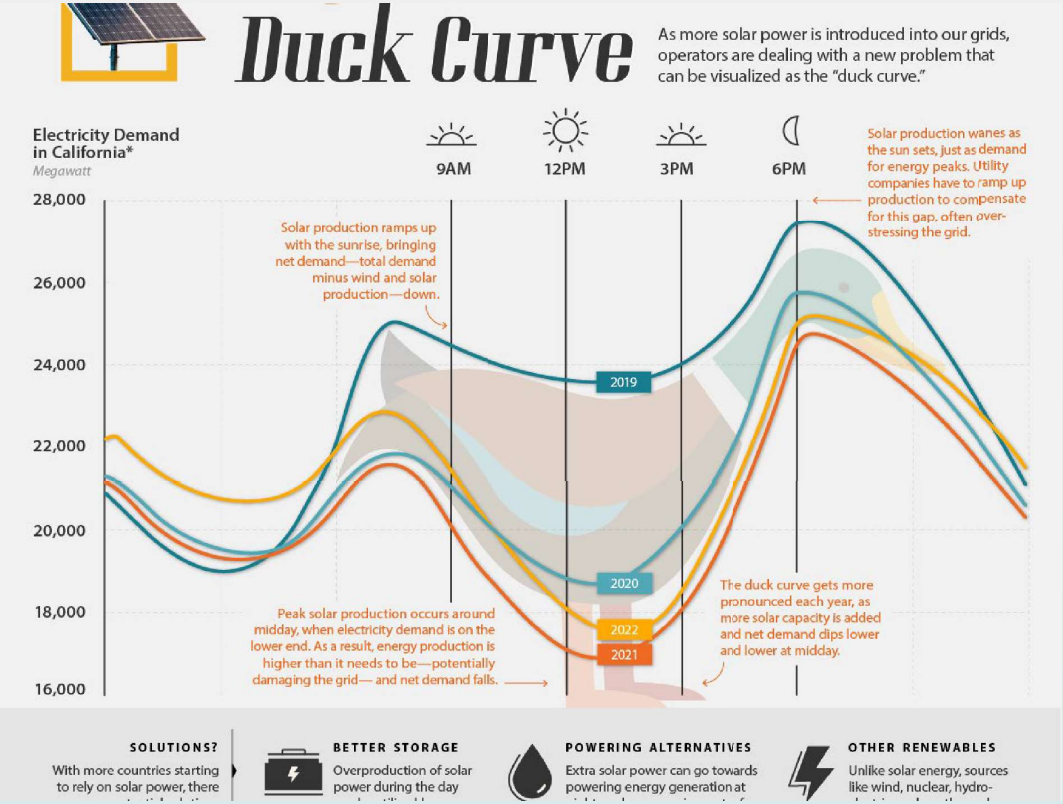
Affordability

- Affordability is also a key concern for families and businesses, and we all need to do a better job of understanding and communicating the challenges our energy system faces, as well as the opportunities, as we undergo such a radical transformation.



Affordability

- **‘Dunkleflautes’** and **‘Duck Curves’** are important from a technical perspective, but for citizens we must ensure that an ‘affordable price,’ which is included in the **IEA’s** definition of energy security, remains at the heart of the conversation as we are choosing the technologies and pathways for the years ahead.



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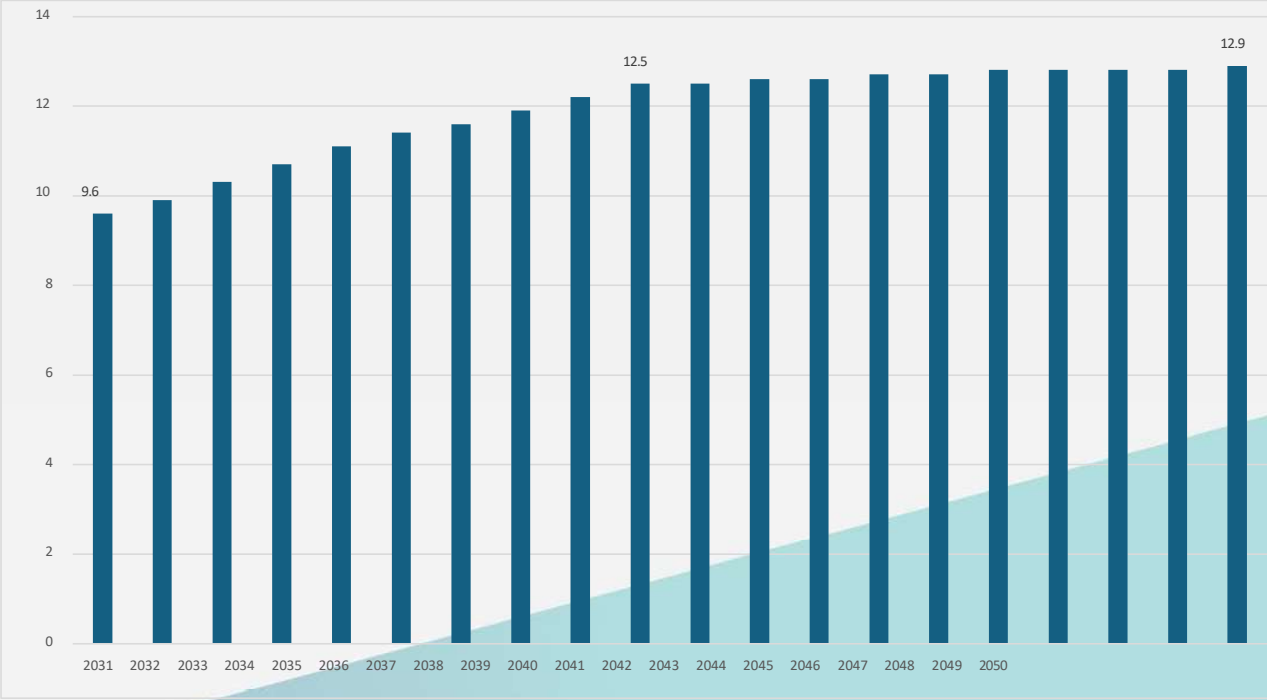
Market Design

Must ensure that Market Mechanisms are in place to incentivise deployment and drive innovation, for example:

- The Renewable electricity Support Scheme (**RESS**)
- The Small Scale Renewable electricity Support Scheme (**SRESS**)
- Regional renewable electricity capacity allocations for solar PV and onshore wind as part of revised National Planning Framework (**NPF**)
- The Decarbonised Electricity system study (**DESS**)

Ireland's Renewable Electricity Ambitions to Underpin Net Zero by 2050

- 9 GW of onshore wind
- 9 GW of solar capacity
- 37 GW of offshore wind generation
- 12 GW of interconnection



Peak Electricity Demand 2031-2050

Collaboration

- We need to ensure other critical supporting enablers are in place and functioning well such as:
  - Interconnection;
  - Storage;
  - Demand response;
  - Critical raw materials
  - System services.

- Cooperation and engagement with our international partners is the best way forward to ensure our collective energy security, and I look forward to engaging with all of you here today on this important topic.

Thank You.