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Energy Storage in Ireland

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Overview of Presentation

1. Current status of Energy Storage in Ireland
2. How is Ireland Promoting Energy Storage?
3. Energy storage legislative framework and energy storage business growth
4. The Future for Energy Storage in Ireland, and the role of IESA

- Important Note:
- Ireland & Northern Ireland (UK) have a Single Electricity Market since 2007 known as the SEM (different legislative frameworks, regulators, TSOs, currencies)
- On 1st Oct this year the I-SEM (integrated single electricity market) has come into force, in line with the EU Target Model
- Assuming the UK leaves the EU next year (Brexit) it is expected I-SEM will continue

Current status of Energy Storage in Ireland

- Ireland has 292 MW pumped hydro storage electricity since 1974 and that was the extent of its energy storage (Turlough Hill)
- Recently there has been significant interest in battery and flywheel energy storage facilities
- The new-found interest in storage is being driven by the high penetration of intermittent (mainly wind) on the system
- Up to 65% SNSP – system non-synchronous penetration - during windy periods, and rising to 75% by 2020
  - at the leading edge in integrating intermittent generation onto the system
- System Operator's requirements for services to help maintain a stable and secure system.

System Operator Issues

- Renewable generation gives rise to two issues
  - Intermittent and/or unpredictable output
  - Lack of inertia/grid stability
- These require storage in different timeframes
  - Storage over many hours
  - Dynamic storage over, say, 20 minutes with a fast response time of a fraction of a second
- Many European countries have grids with high % renewable that are supported by grids with low % renewable through AC interconnection; however the latter will also have high % renewable in future

Storage Developments in Recent Years

- DS3 Programme: Providers contract with the TSOs to supply System Services mainly during periods of high wind/solar gen.

- AES in N. Ireland has a 10 MW battery-based energy storage facility providing balancing services to the TSO
- Schwungrad Energie (Ireland) has fully tested a battery/flywheel hybrid plant in conjunction with the TSO (US flywheels)
- Schwungrad embarking on new testing with German flywheels
- Some companies testing battery storage with large energy users
  - load balancing & peak lopping to avoid peak tariffs (DSM), back-up supply
- Others doing tests with supercapacitors

How is Ireland Promoting Energy Storage?

- In May 2013, the **EU Regulation on Guidelines for Trans-European Energy Infrastructure** came into force. These guidelines aim to ensure that major EU energy infrastructure of strategic importance to Europe, including networks and **storage facilities**, are in place by 2020.
- The **EU's Energy Roadmap 2050** confirms that storage technologies remain critical, and that future integration of RES-E will depend on increased storage capacity.
- **Govt White Paper on Energy entitled "Ireland's transition to a low carbon energy future 2015 -2-30) states:**
  - "address any administrative, market or regulatory barriers to the implementation of energy storage projects"
  - "will examine the case for designating large-scale storage projects as strategic energy infrastructure https://www.dccae.gov.ie/documents/Energy%20White%20Paper%20-%20Dec%202015.pdf
- **The Government's new national development plan** envisages a radical overhaul of how the State tackles climate change, allocating €22 billion - one fifth of the entire budget - to a series of measures that will turn Ireland into a low-carbon economy by 2050
- **National Renewable Energy Action Plan IRELAND is submitted in accordance with Article 4 of Directive 2009/28/EC**
  - Report submitted every 2 years with final report in Dec 2021
- SEM Committee in conjunction with the Department of Communications, Climate Action & Energy

- **Increasingly ambitious/challenging renewable targets -> largely intermittent gen**
  - **driven by the need to combat climate change**

Energy Storage Legislative Framework And Energy Storage Business Growth

- Legislative framework translated into concrete measures through the Single Electricity Market e.g:
  - Identification of 7 new system services needed in addition to 7 existing services
  - A tariff structure for all 14 services, hence storage investors can model their revenue streams and consider commercial projects with their required IRR (for new assets)
  - A procurement process has been developed by the TSOs/Regulators with six-year contracts for those winning contracts in the competitive DS3/System Services auctions
  - The first such auction is planned for August 2019
  - It is expected there will be pre-qualification and then performance bonds for those awarded contracts
  - Existing assets/plant can contract on a year-on-year basis
  - New storage can bid in the capacity auctions, but it is not fully clear as yet how this work
    - The first multi-year capacity auction is due to take place in March 2019

Energy Storage Contracts

Fixed 6-Yr Contract (Volume Capped)

- **High Availability technology e.g. batteries**
- **6 year contract term, no EirGrid termination right**
- **Fixed Tariff rates**
- **Fixed Scalars**
- **Fixed Volume Contract for:**
  - **FFR to TOR2**
- **Competitive tender process to begin in 2019**
  - **Offering a discount from the Volume Uncapped tariff rate**
- **Other services contracted as Volume Uncapped e.g. SSRP**

- **Tariff (Volume Uncapped)**
  - 5 year contract term, annual termination right
  - Tariff rates and Scalars can be changed yearly
    - Tariff rates published set the Cap for bids in the Volume Capped process
  - Separate volumes by product
  - Tariff awarded if Technically Qualified
    - Available to all plant

In Conclusion

- Ireland is at the forefront of % intermittent renewables on system
- Renewable sector is pushing for ambitious/challenging targets to be set including 70% electricity from renewables by 2030
  - With instantaneous penetration rising from 75% in 2020 to 90% in 2030
- This clearly points to a key role for storage in the future, both balancing supply/demand and grid security/stability
- Concerted push needed in Europe & globally for renewables
  - EU & funding agencies need to up their game on R&D projects

Irish Energy Storage Association

- The Irish Energy Storage Association will represent this sector:
  - Lobby at home on deployment of storage in line with market needs
    - Also, on grid code, market entry, trading rules, etc
  - Helping to share knowledge and experience as we all learn
    - but recognising the practicalities of competition
  - Promote the application of storage in developing economies and particularly for remote and island communities

Thank You

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