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ENERGY STORAGE IS NOT WHISKEY – BLENDS ARE BEST!

SEAMUS GARVEY, UNIV. OF NOTTINGHAM

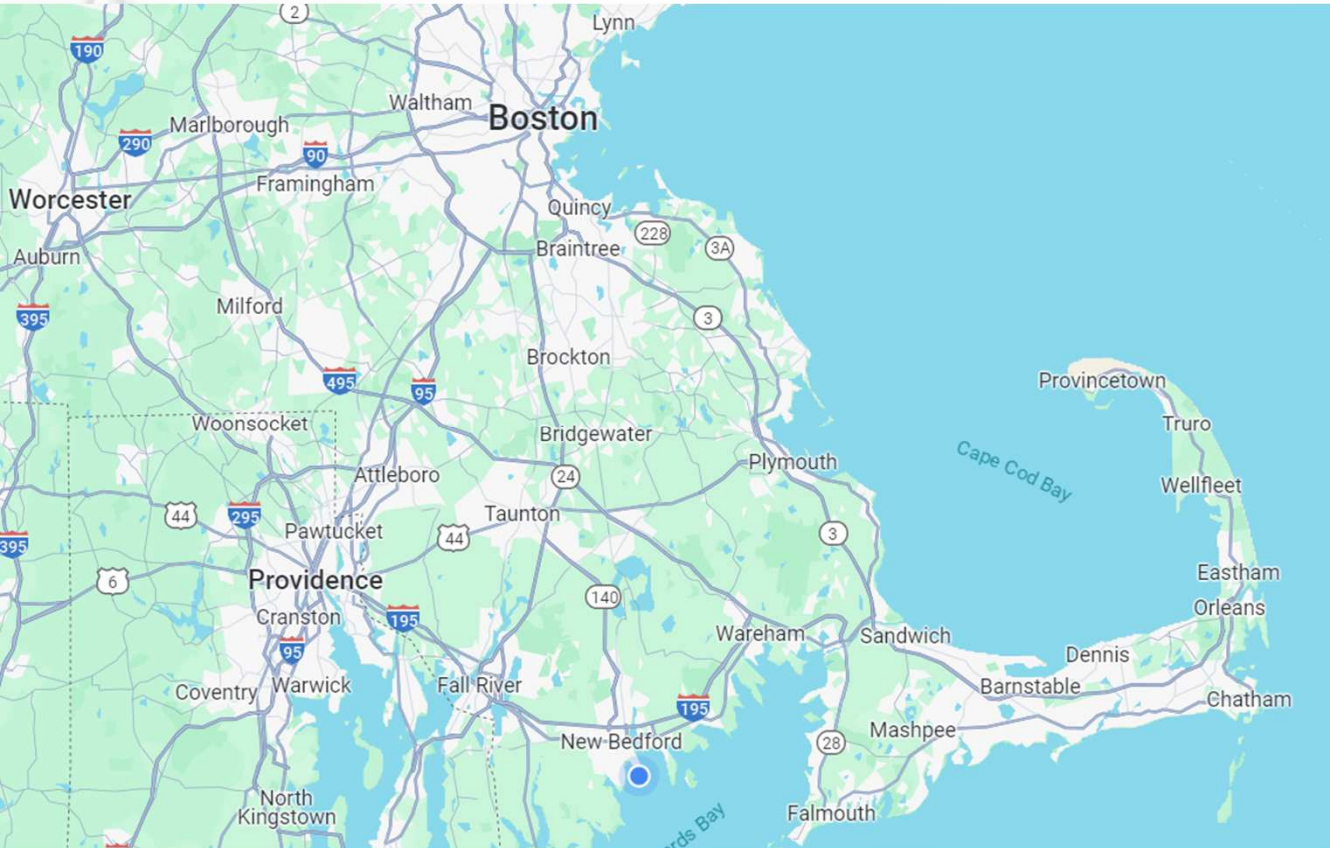
Biggest Net Zero
Conference for a
Brighter Tomorrow

NetZeroWeek™
6 – 12 July 2024

#NetZeroWeek

<https://netzeroweek.com/event-agenda/>

GREETINGS FROM MASSACHUSETTS

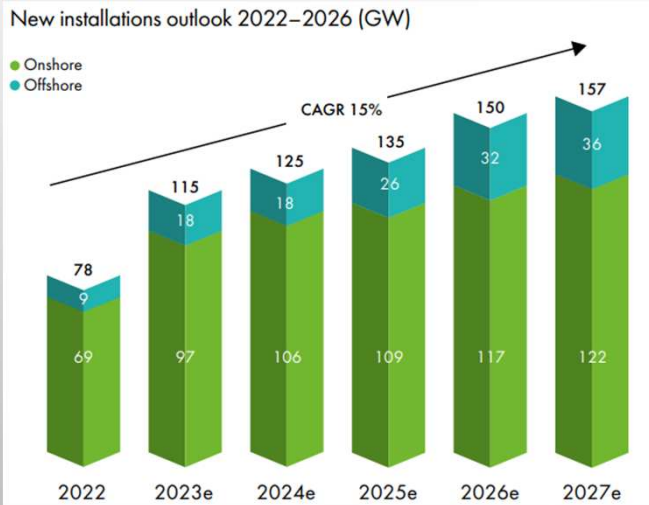


Thanks due to UMassD for allowing me to use their conference room!



AN INTERESTING TIME FOR ENERGY

Renewables are growing very fast



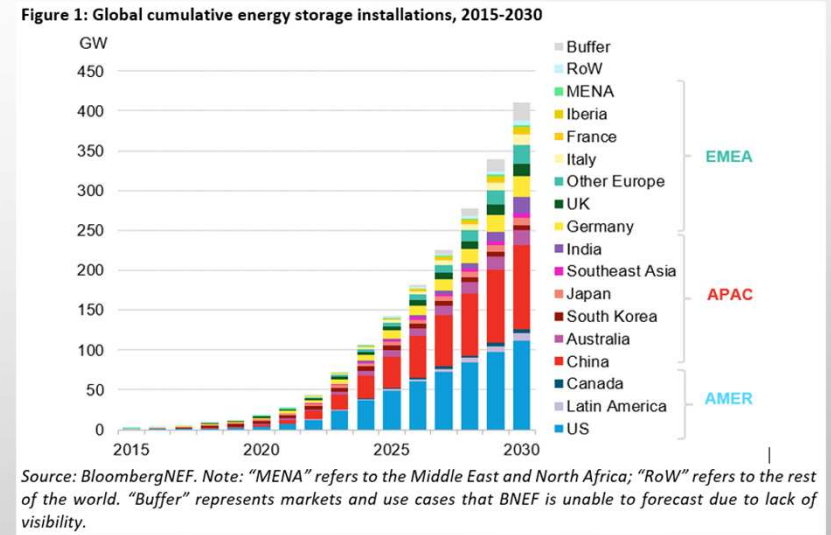
c.f. https://gwec.net/wp-content/uploads/2023/04/GWEC-2023_interactive.pdf

Climate change is baring its teeth



https://www.fbds.org.br/cop15/FBDS_MudancasClimaticas_EN.pdf

Energy storage is burgeoning



<https://about.bnef.com/blog/global-energy-storage-market-to-grow-15-fold-by-2030/>

THE (2023) ROYAL SOCIETY REPORT

c.f. <https://royalsociety.org/topics-policy/projects/low-carbon-energy-programme/large-scale-electricity-storage/>

The *baseline case* in the Royal Society Report has ...

100% Generation from R.E. ... with $\sim 30\%$ over-genn.

Wind:Solar ... approximately 80:20 mix by energy.

Storage mainly via H_2 in caverns ... ~ 44 days!!

Storage input power ... $\sim 5\%$ above mean generation.

Storage output power ... \sim peak power consumption.

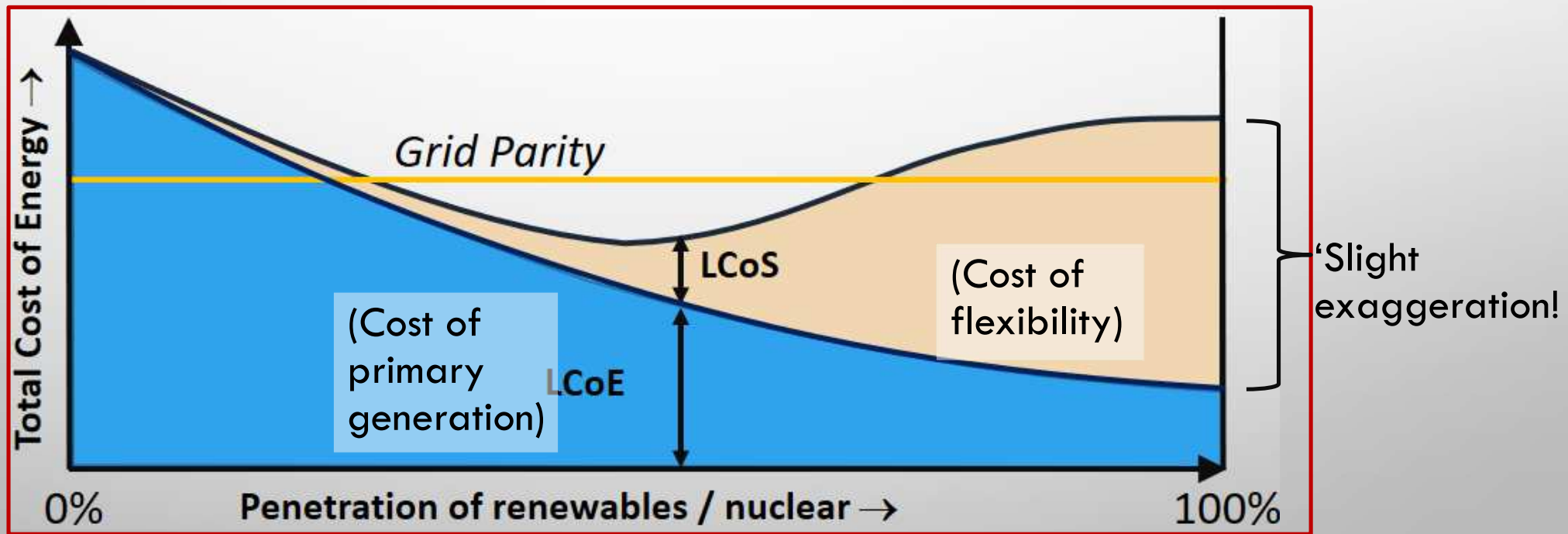
Approximately 25% of electricity consumed comes out of storage!



3 GRAPHS WITHOUT NUMBERS: GRAPH #1

Graph #1: from ~2017 ...

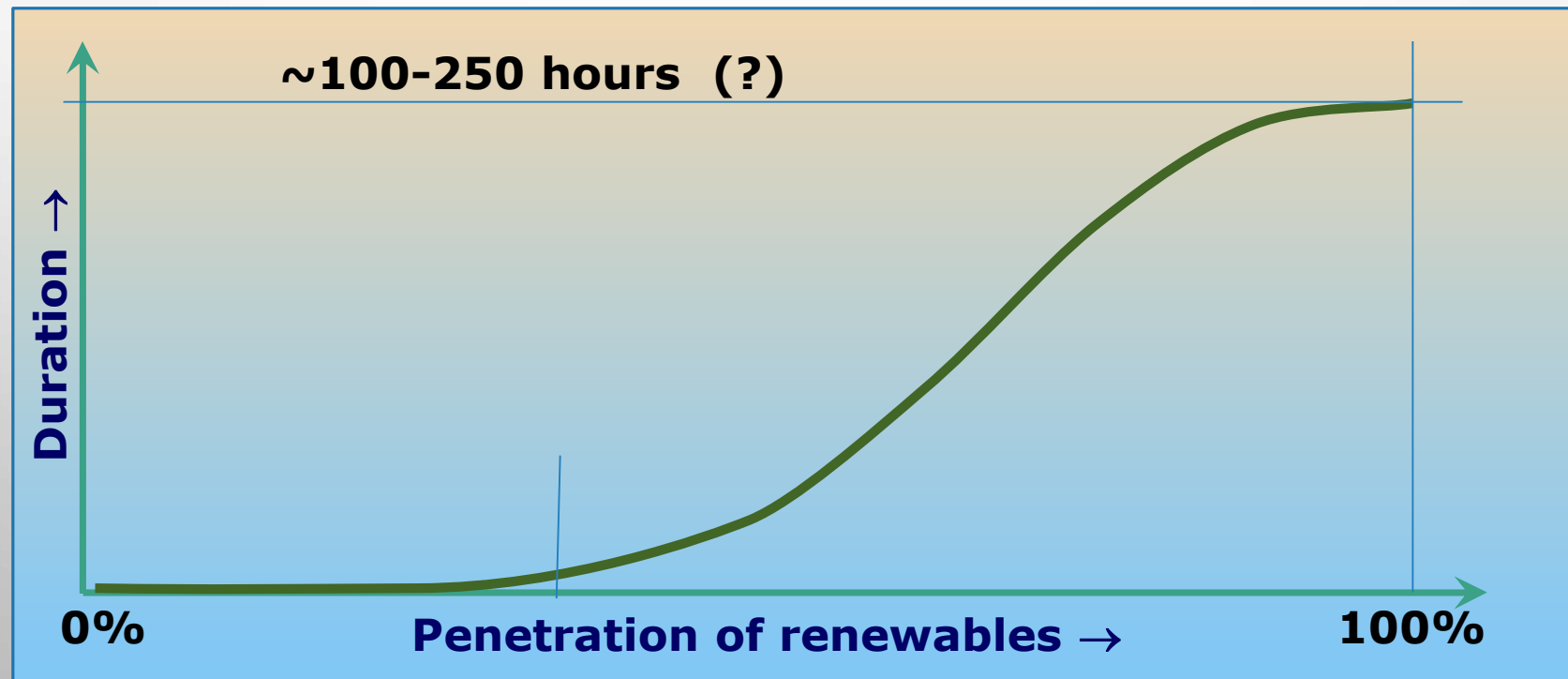
Flexibility will account for increasing amounts of the total cost of electricity



3 GRAPHS WITHOUT NUMBERS: GRAPH #2

Graph #2: from ~2019 ...

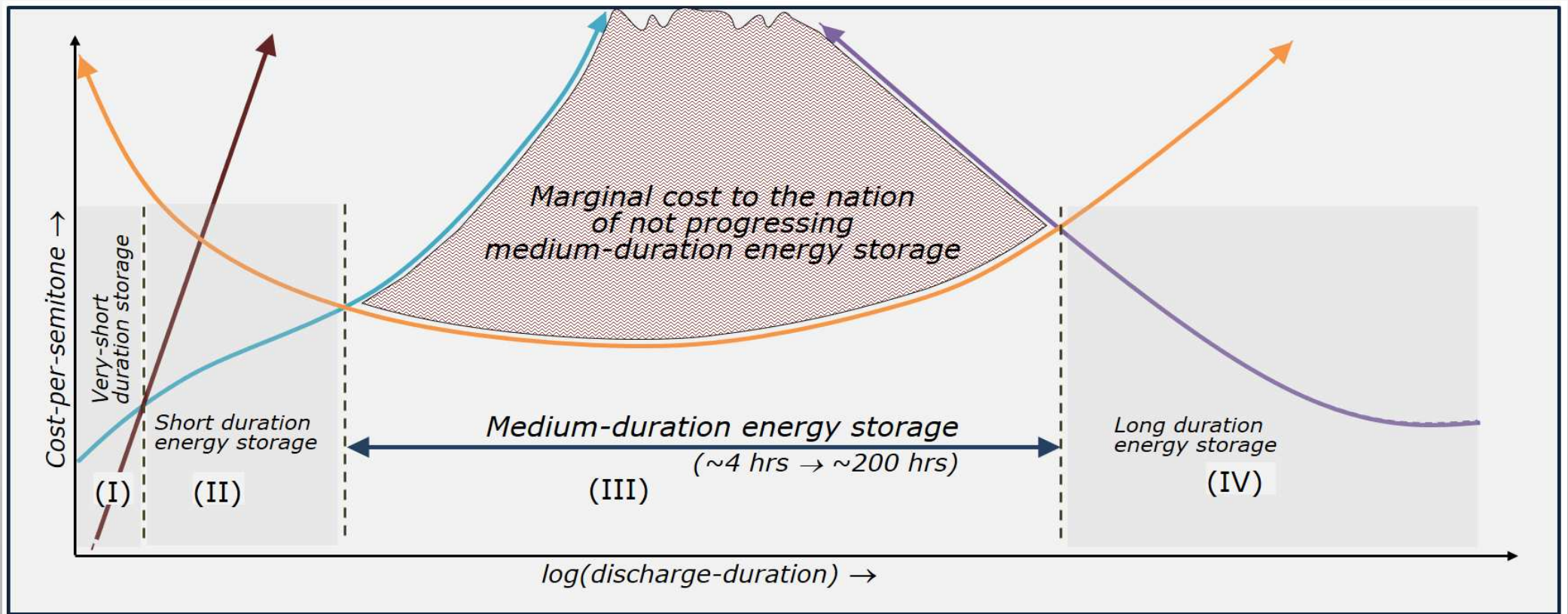
The average discharge time of energy from storage will grow with RE penetration



3 GRAPHS WITHOUT NUMBERS: GRAPH #3

Graph #3: from March 23, 2020 ...

There are really 4 different important ranges of discharge-times in energy storage



THE WEBINAR PROGRAMME TODAY

- Seamus Garvey, Univ. of Nottingham (Introduction)
- (Prof) Keith Pullen, CTO at Levistor (Flywheels)
- Dr. John-Joseph Marie, Principal Analyst at the Faraday Institution (Batteries)
- Seamus Garvey, Univ. of Nottingham (M.D.E.S.)
- Dr. Nerea Martinez Hipolito, H2 Intel. Service Manager @ LCP Delta (Hydrogen)

15 minutes total for each speaking slot – including questions.

- ◆ Any comments to make ... use the “chat” tool
- ◆ Any Questions ... use “Q&A”. Please make clear which speaker you are addressing.
- Most questions will be addressed by the speakers online.