

SESSION 3:

RENEWABLES – BARRIERS AND OPPORTUNITIES



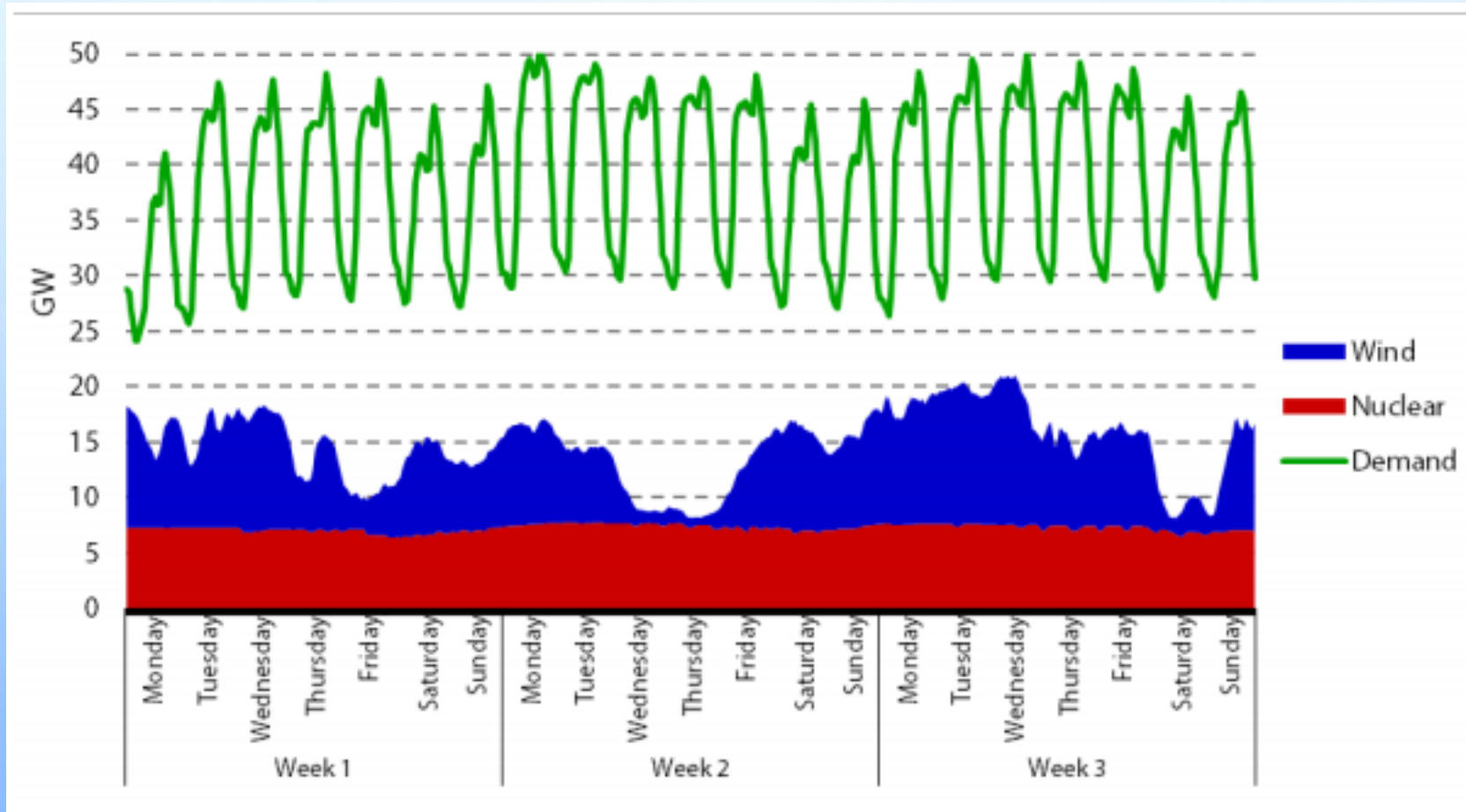
BARRIERS

- TECHNOLOGY
- INFRASTRUCTURE AND INTEGRATION
- INTERMITTENCY
- INCUMBENT ENERGY PROVIDERS
- REGULATION / STANDARDS
- STAKEHOLDERS AND GOVERNMENTS





INTERMITTENCY – UK JAN 2018



INTERMITTENCY - SOLUTIONS

- UP TO 15% RENEWABLES: BETTER GRID CODES, BETTER FORECASTING, BETTER SCHEDULING (OPERATIONAL ADJUSTMENT)
- UP TO 75% RENEWABLES: MAKE EXISTING POWER PLANTS MORE FLEXIBLE; ENHANCE THE GRID; DEMAND SIDE MANAGEMENT; AND SELECTIVE USE OF NEW STORAGE TECHNOLOGIES; BLEND OF RENEWABLES
- OVER 75% RENEWABLES: LOWER BATTERY COSTS AND WIDER DEPLOYMENT; SYSTEM INTEGRATION WITH TRANSPORT AND HEAT; THE USE OF ELECTRICITY TO MAKE HYDROGEN THROUGH ELECTROLYSIS.
- ENERGY MANAGEMENT AND STORAGE BECOMES MORE IMPORTANT AS RENEWABLE ENERGY PENETRATION INCREASES

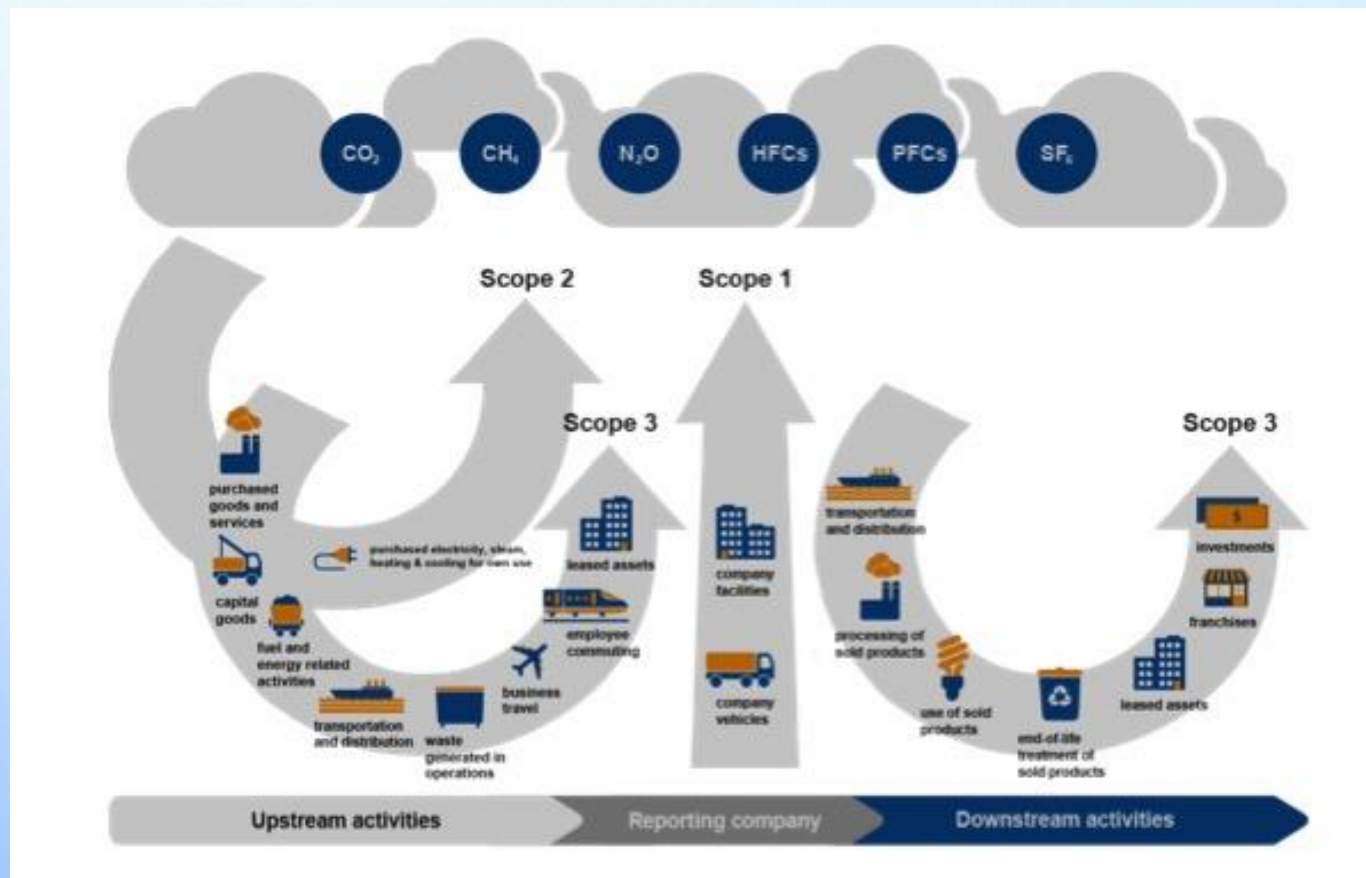


How we get
to net zero?



OPPORTUNITIES

- OIL AND GAS REIMAGINED
- PARIS AGREEMENT
- NATURAL RESOURCES
- ENERGY STORAGE
- DISTRIBUTED ENERGY
- THE GRETA EFFECT
- FINAL COURSE SESSION



RESOURCES

[HTTPS://WWW.CARBONTRUST.COM/RESOURCES/BRIEFING-WHAT-ARE-SCOPE-3-EMISSIONS](https://www.carbontrust.com/resources/briefing-what-are-scope-3-emissions)

[HTTPS://WWW.R-E-A.NET/WP-CONTENT/UPLOADS/2019/10/ENERGY-STORAGE-FINAL6.PDF](https://www.r-e-a.net/wp-content/uploads/2019/10/energy-storage-final6.pdf)

[HTTPS://WWW.THECCC.ORG.UK/WP-CONTENT/UPLOADS/2019/04/TECHNICAL-ANNEX-
INTEGRATING-VARIABLE-RENEWABLES-INTO-THE-UK-ELECTRICITY-SYSTEM.PDF](https://www.theccc.org.uk/wp-content/uploads/2019/04/technical-annex-integrating-variable-renewables-into-the-uk-electricity-system.pdf)



Q & A

