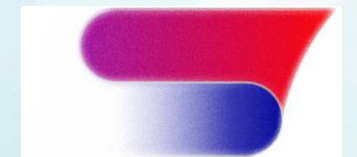


# International norms and standards

Daniel Colbourne (Re-phridge/HEAT GmbH)



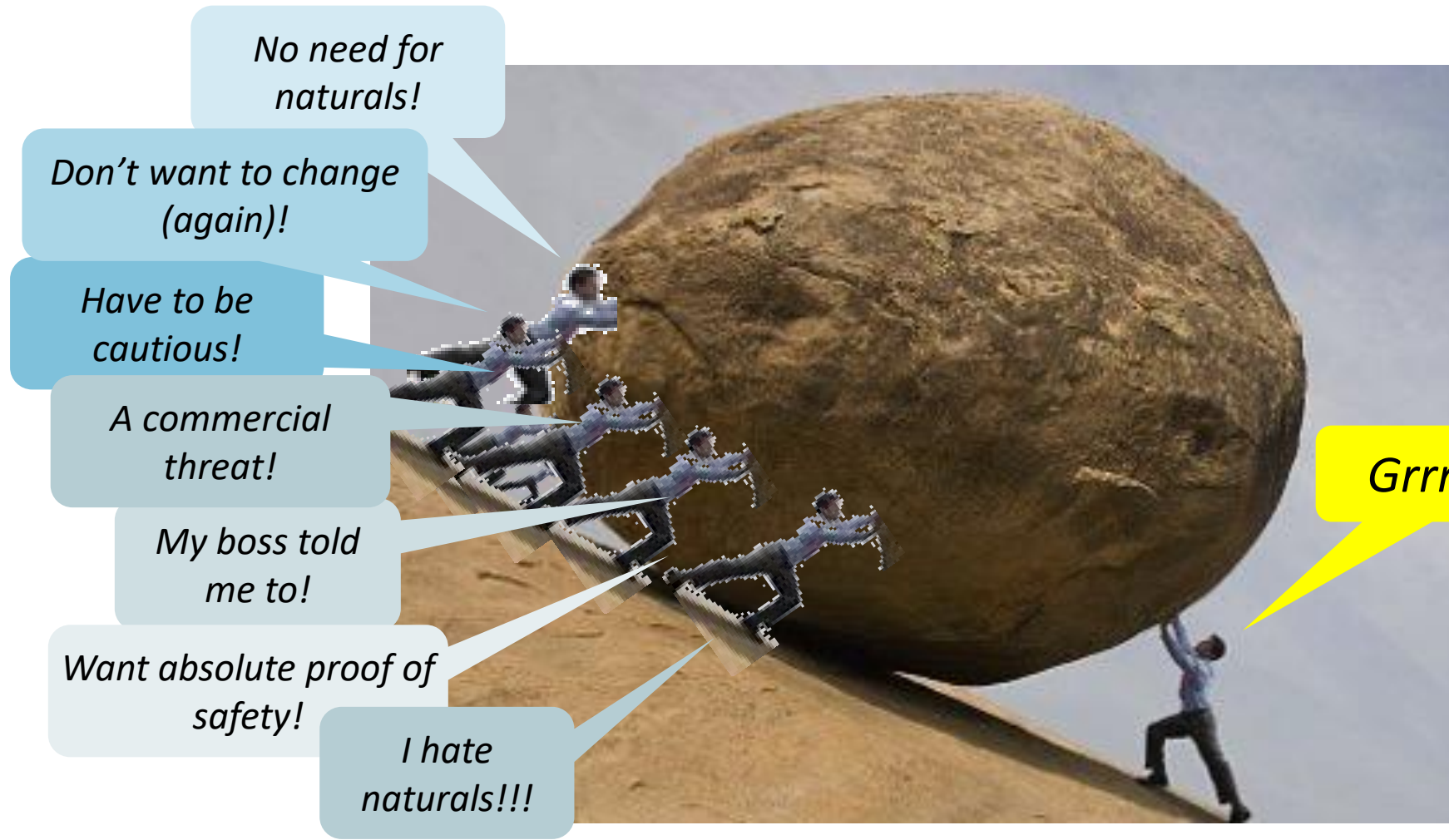
# Introduction



- Good safety standards critical to successful deployment of NRs
  - Help minimise chance of accidents
  - Should allow relatively unhindered use of NRs
- Historically, R744 and R717 have not been hindered, but HCs have (and are) severely hindered
  - Degree of hindrance for HCs has been highly obstructive for many applications



# Standards development dynamics



**But...**



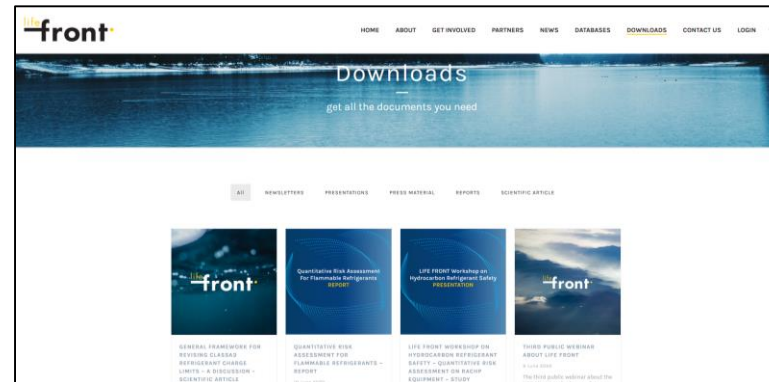
# New developments

- Extensive R&D on HC flammability safety has been carried out to help progress standards
  - Dispersion in unventilated rooms
  - Mixing of leak with airflow
  - Quantifying real leakage and leak tightness
  - Risk assessment
  - Detection and safety systems
- Greater participation of NR stakeholders



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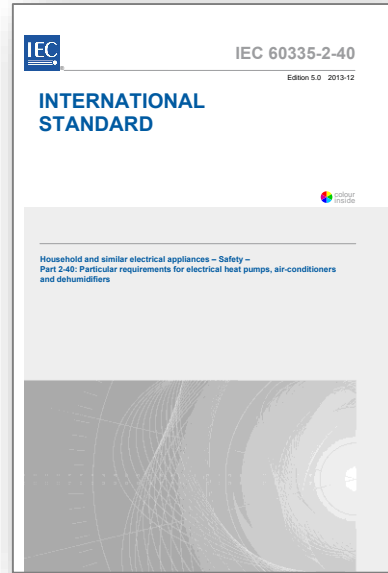
**COOL CONTRIBUTIONS FIGHTING CLIMATE CHANGE (C4)**



# Outlook



IEC 60335-2-89: 2019



IEC 60335-2-40: 2021 ?



EN 378: 2022/3 ?



ISO 5149: 2023/4 ?







