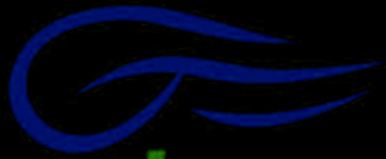


Compressed Air Energy Storage



Keith McGrane

The Need for Storage



The Need for CAES
Gaelectric

CAES: Compressed Air Energy Storage

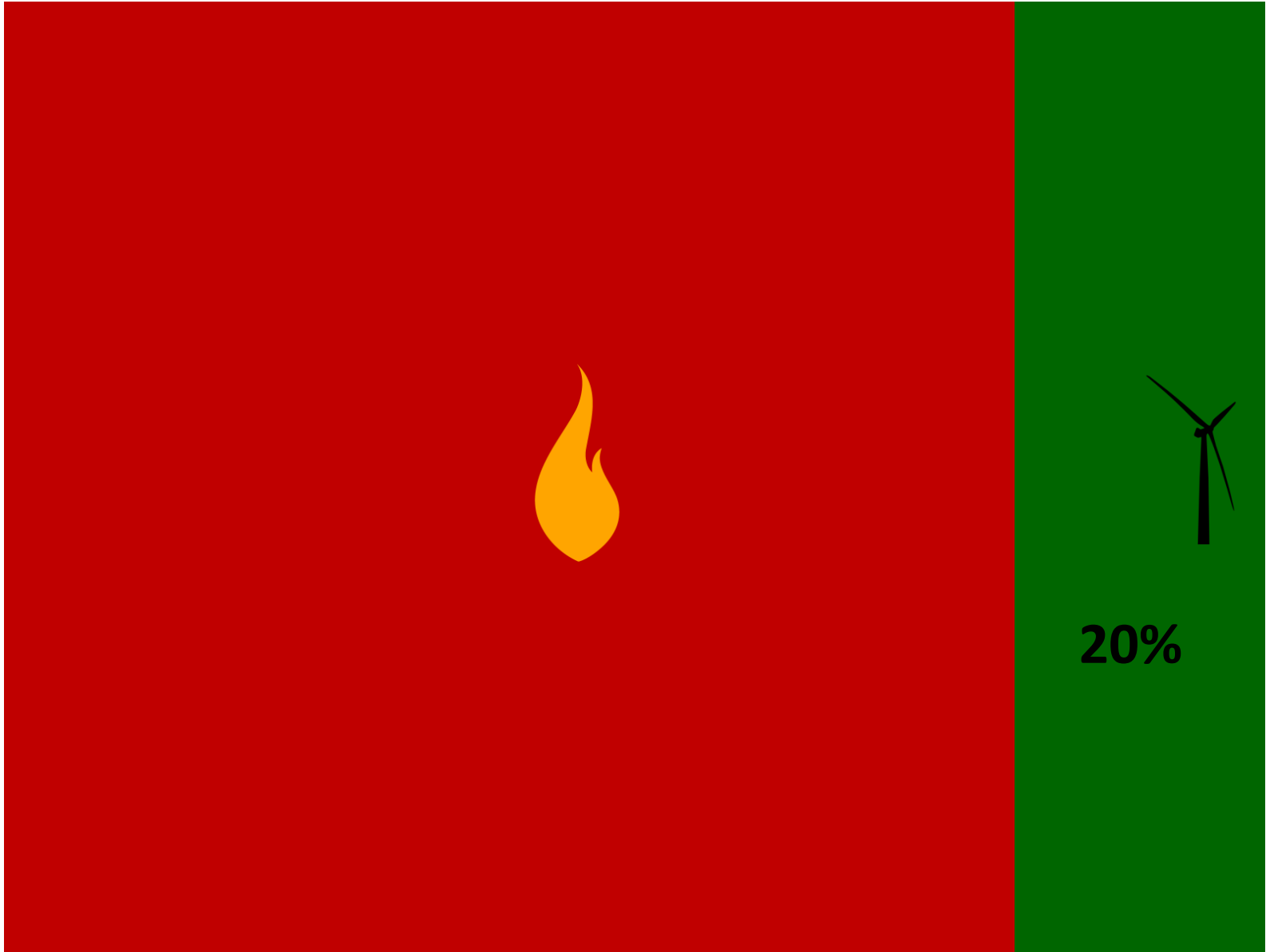
The Need for Gaelectric

2011

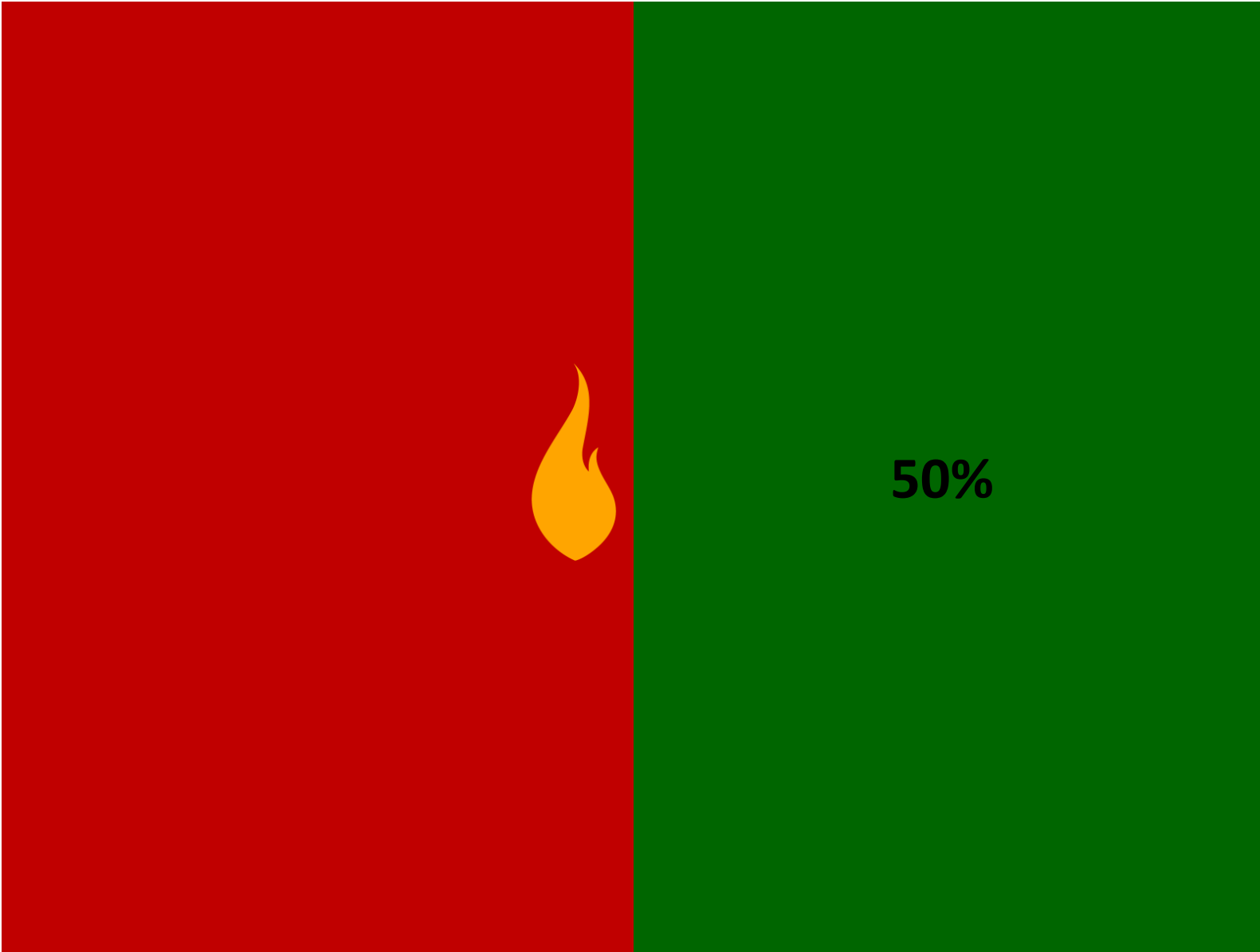


10%

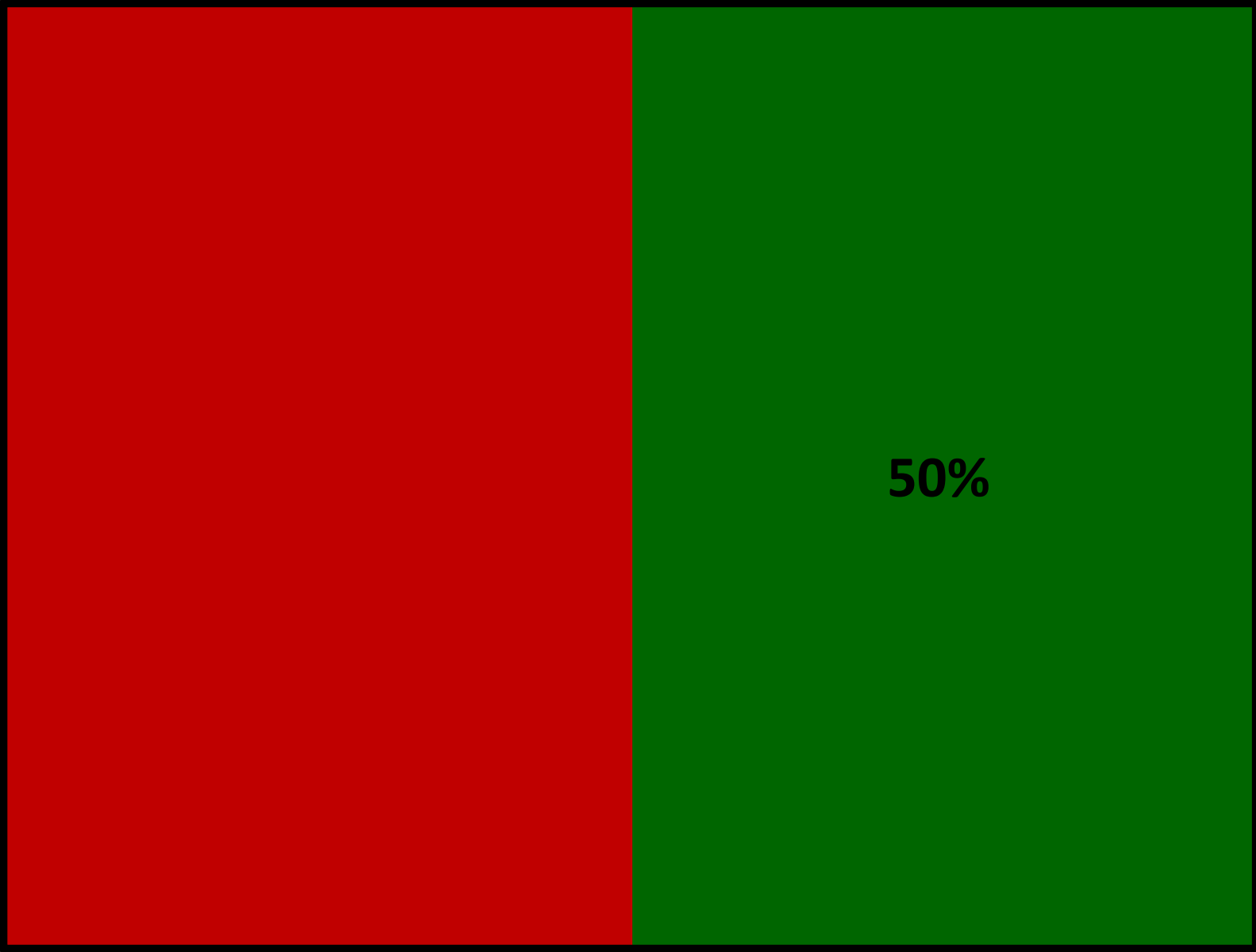
2001



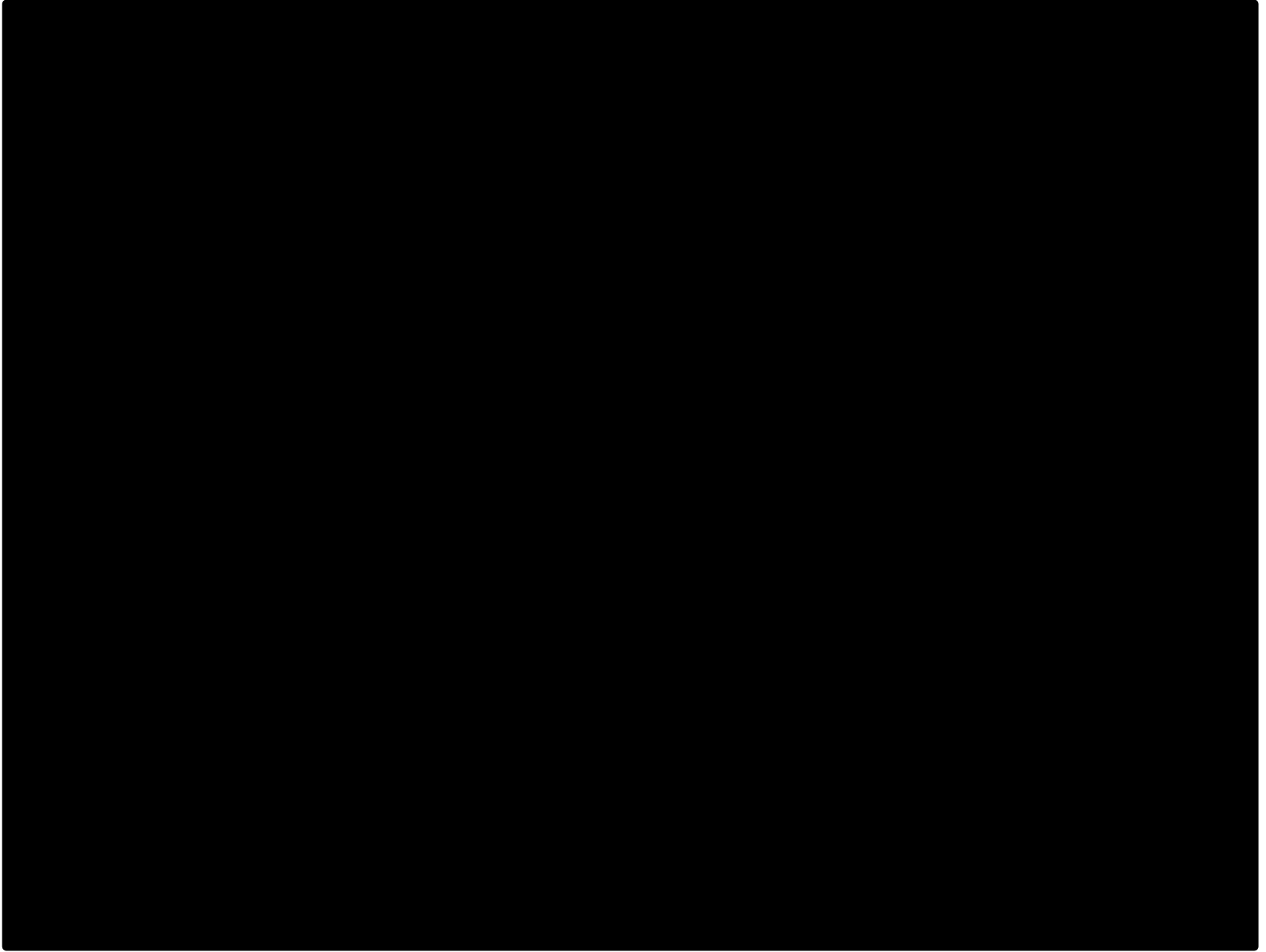
Peak Wind



Peak Wind



Cascading Blackout





“Within three years, we will see the **reserve** margin of generation fall from about **14%** to less than **5%**. That is uncomfortably tight.”

- Alistair Buchanan, Chief Executive, Ofgem, UK, Feb 14



REUTERS

“Some **50 GW** of gas-fired capacity in Europe has been **closed or mothballed** by 10 of the continent's biggest utilities in response to weak demand and the **rise of renewable energy.**”

- Christoph Steitz and Stephen Jewkes, Mar 14

CHRISTIE'S

LEHMAN BROTHERS

Reserves: 1-2 %

The Need for CAES

How CAES works

Excess
Electricity

Compress
air

Reheat

Expand

Power
generation

Grid

Store
underground

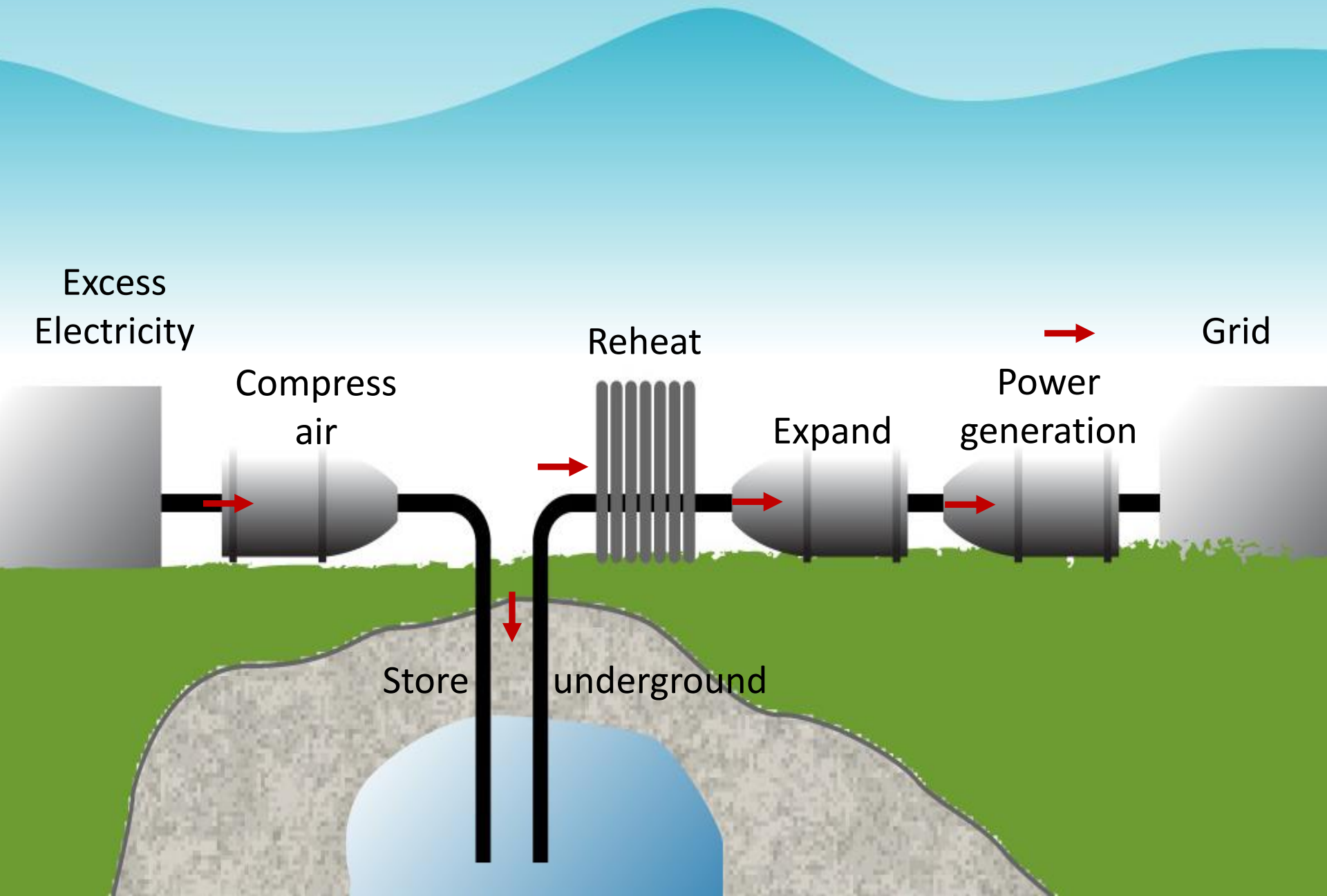




Table 4 Rate determination

| Product | Unit | Total |
|---------|--------------------|-------|
| SIR | MWs ² h | 8 |
| FFR | MWh | 41 |
| POR | MWh | 39 |
| SOR | MWh | 24 |
| TOR1 | MWh | 29 |
| TOR2 | MWh | 27 |
| RR | MWh | 4 |
| DRR | MWh | 2 |
| RM1 | MWh | 9 |
| RM3 | MWh | 18 |
| RM8 | MWh | 19 |
| FPFAPR | MWh | 62 |
| SSRP | Mvarh | 38 |
| DRP | MWh | 35 |



DS3:
System Services Review
TSO Recommendations

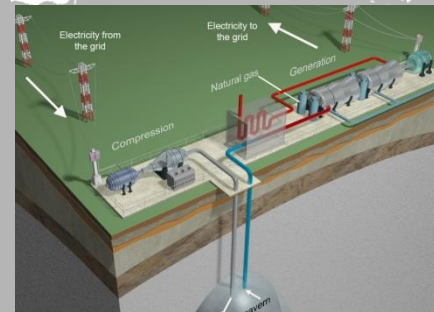
Report to the SEM Committee

gns

| Dispatch-Independent with Scalar | Dispatch-Dependent with Rate Scalar |
|----------------------------------|-------------------------------------|
| 44 | 0.00291 |
| 51 | 22.4207 |
| 43 | 16.6604 |
| 65 | 8.4992 |
| 30 | 10.0709 |
| 70 | 5.9079 |
| 90 | 0.6536 |
| 47 | 0.8553 |
| 52 | 0.8751 |
| 33 | 1.5918 |
| 40 | 1.1316 |
| 63 | 2.6014 |
| 89 | 0.6790 |
| 86 | 0.9536 |

Huntorf, Germany - 1978

McIntosh, Alabama - 1991





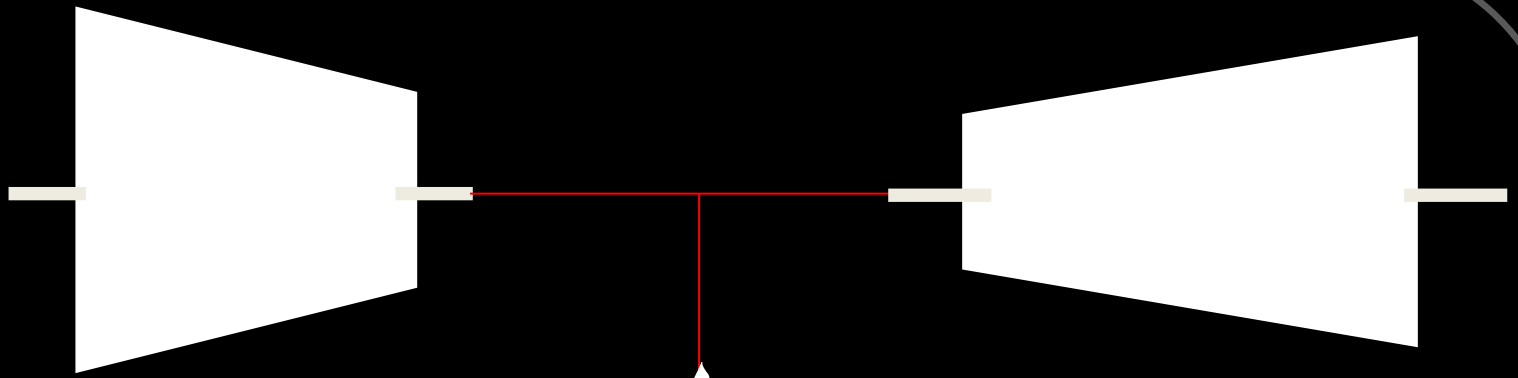
The Need for Gaelectric

Gaelectric, Larne - 2014



Artist impression

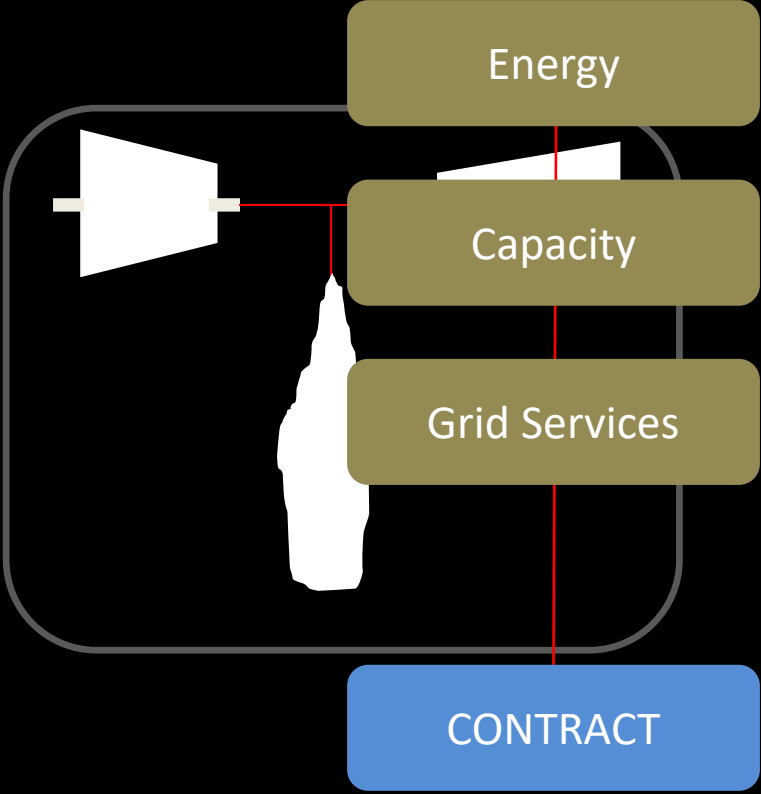
- Planning submission – Q2, 2014
- Financial close – Q3, 2014
- COD – 2017

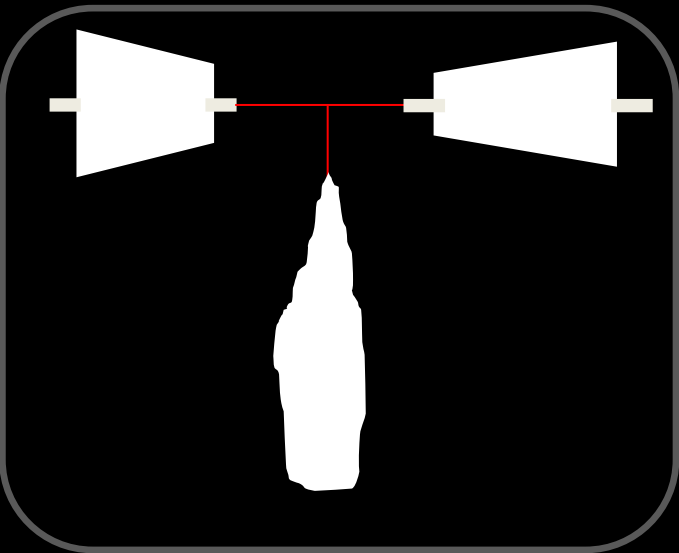


Compression

Generation

Storage





Revenue for services

€Returns

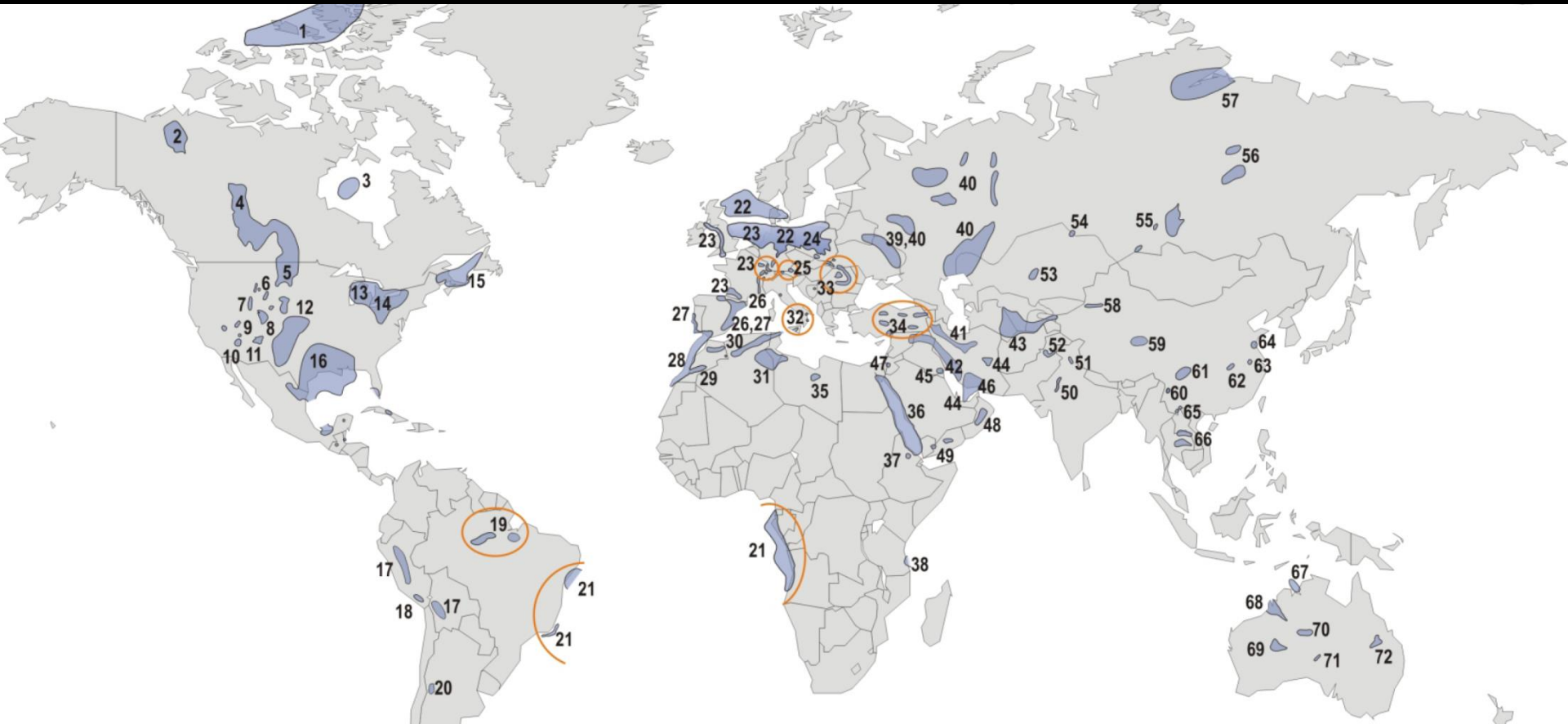
€XXm

Equity upside

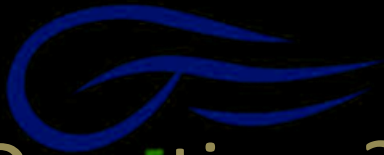
Bx

Ownership IPR

Y-Z%



applicable worldwide



Questions?

Gaelectric

POWER FROM NATURE