

## “Vanadium reflux flow battery” experiment

A remote wind farm on the Scottish island of Gigha is to be connected to seven shipping container-sized *vanadium redox flow batteries*, a new class of device that could revolutionise renewable energy

## SYSTEM SET-UP

**Battery array:** Seven shipping containers house batteries. Eighth container controls system

**Container:**  
Holds four  
battery  
units

Stored energy:  
**.68MWh**

Cost:  
\$5m

**Electrolyte:**  
Solution  
separated  
into half-cells

**Cell stack:**  
Divided by  
membrane

**Wind turbine:**  
330kW

**Power:**  
Electricity  
harvested  
from wind  
turbine

**Cell stack:**  
Battery  
“engine”

**Half-cells: —**  
One side  
negative,  
other positive

### Discharged system (flat)

## Cell stack membrane

**Charging:** Vanadium electrolyte pumped through cell stack. Electrons pass through membrane

## Redox reaction

On discharge reaction is reversed. Electron flow becomes electric current



SCOTLAND  
**Edinburgh**

*GIGHA  
ISLAND*

***Dancing  
Ladies  
of Gigha***  
windfarm

Picture: Vestas