

## Nanoscale Sensors for CO<sub>2</sub> Monitoring : NASCOM

Tony Espie on behalf of Nascom Team



# Nascom : what is it about ?

## Objectives

Development of **innovative gravity and position sensors** capable of making quantitative measurements of CO<sub>2</sub> volume for deployment in reservoir boreholes.

## Deliverable

Design and proof of concept performance tests at enhanced lab scale.

## Partners

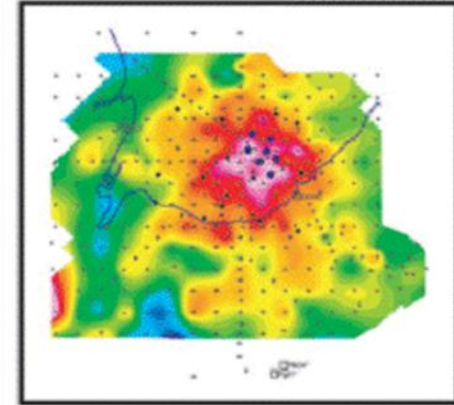
BP Alternative Energy  
University of Cambridge

## Timeframe

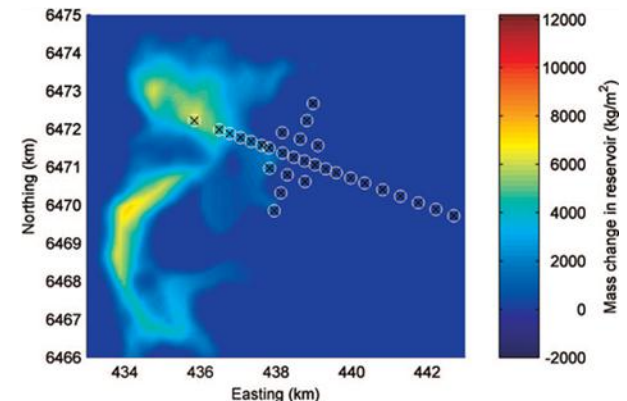
March 2010 – May 2013

## Cost:

£1.2 million funded by  
UK Technology Strategy Board (49%)  
BP Alternative Energy (51%)



Time lapse gravity at Prudhoe Bay



Time lapse gravity at Sleipner



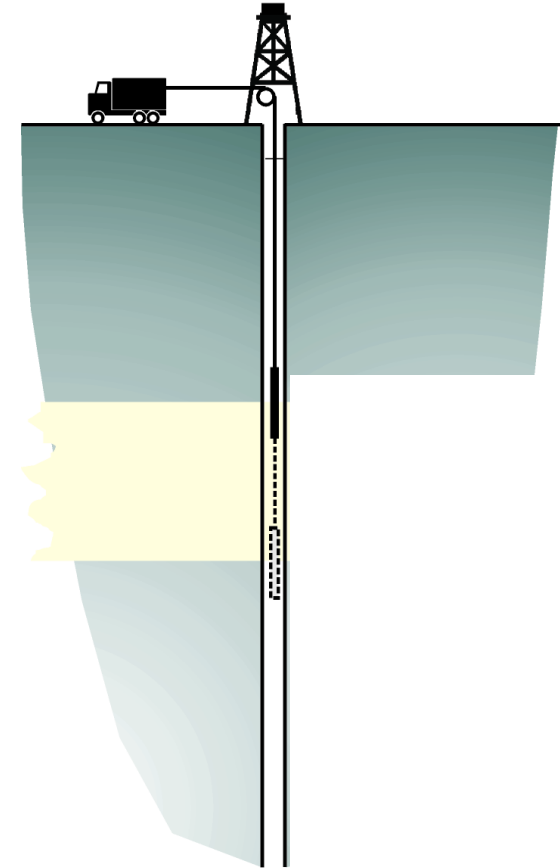
# The Nascom Challenge

## Development of a triaxial gravity sensor measurement system :

- Capable of deployment as array of 20-100 sensors for monitoring of fluid changes deep (10's - 100's m) within the reservoir
- Fit in 1 11/16" tool capable of deploying through tubing
- Deployable via conventional wireline and as a 'permanent' array for long-term continuous monitoring
- Any well deviation
- 20,000 psi and 125-150C

## Development of 3D position sensor

- Integrated with gravity, for high resolution positioning





# Project Status

## Design methodology

Robust design process developed for triaxial gravity sensor and rate gyro

## Laboratory testing

Test devices fabricated and extensive performance database acquired

## Field testing

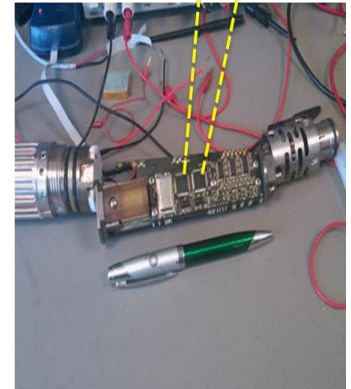
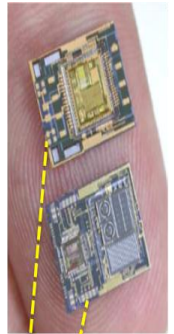
Successful trial in test well

## Proof of concept

Design approach validated

## Way forward

Phase 2 in planning to productise designs and move to prototype tool



# Acknowledgements



The Nascom team gratefully acknowledges the support of the UK Technology Strategy Board and BP in funding this project