

# Centrica Energy Upstream is well positioned to deliver strong returns



## Scale

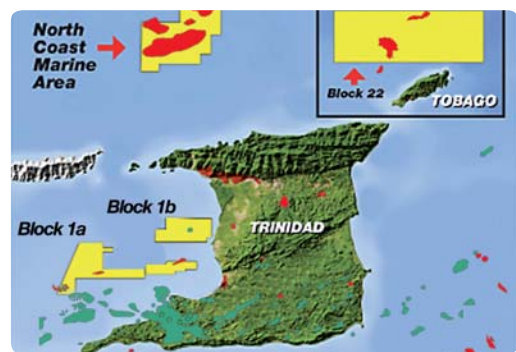
- 7th largest producer in the UKCS
- 3rd largest owner of net acreage in UKCS
- 5 locations and over 50 producing assets
- Strategic positions in Norway, The Netherlands and Trinidad
- Trinidad acquisition provides first producing Liquefied Natural Gas (LNG) position
- ~£2bn in potential new investments over the next 3 years

## Scope

- Leading consolidator of mature and orphaned assets on the UKCS – natural owner of North Sea gas assets
- Growth positions in the Netherlands, Norway and Trinidad
- Uniquely positioned flexible portfolio and skill set to deliver a sustainable level of production

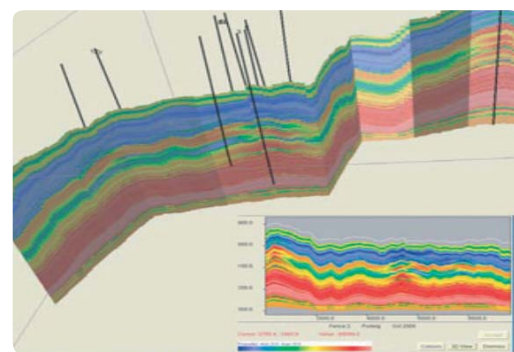
# Centrica Energy Upstream is a **full service operator** with the required capabilities to continue to build on our strategy

## Business Development



- Good relationships with the key players
- Well established reputation as a serious player
- Strong track record of identifying and acquiring strategic assets, e.g.
  - Venture Production
  - Suncor Energy's Trinidad portfolio

## Subsurface



- Experienced teams
- Extensive experience in tight gas reservoirs
- Proven track record in applying cutting-edge subsurface engineering technologies

## Project Management



- Industry leading drilling and project management capability
- Ability to move fast, whilst maintaining flexibility
- Efficient field development and sub-sea tiebacks
- Innovative technical solution implementation

## Operations



- Strong HSE record
- Proven track record in stewardship of mature assets
- High uptime performance of existing assets

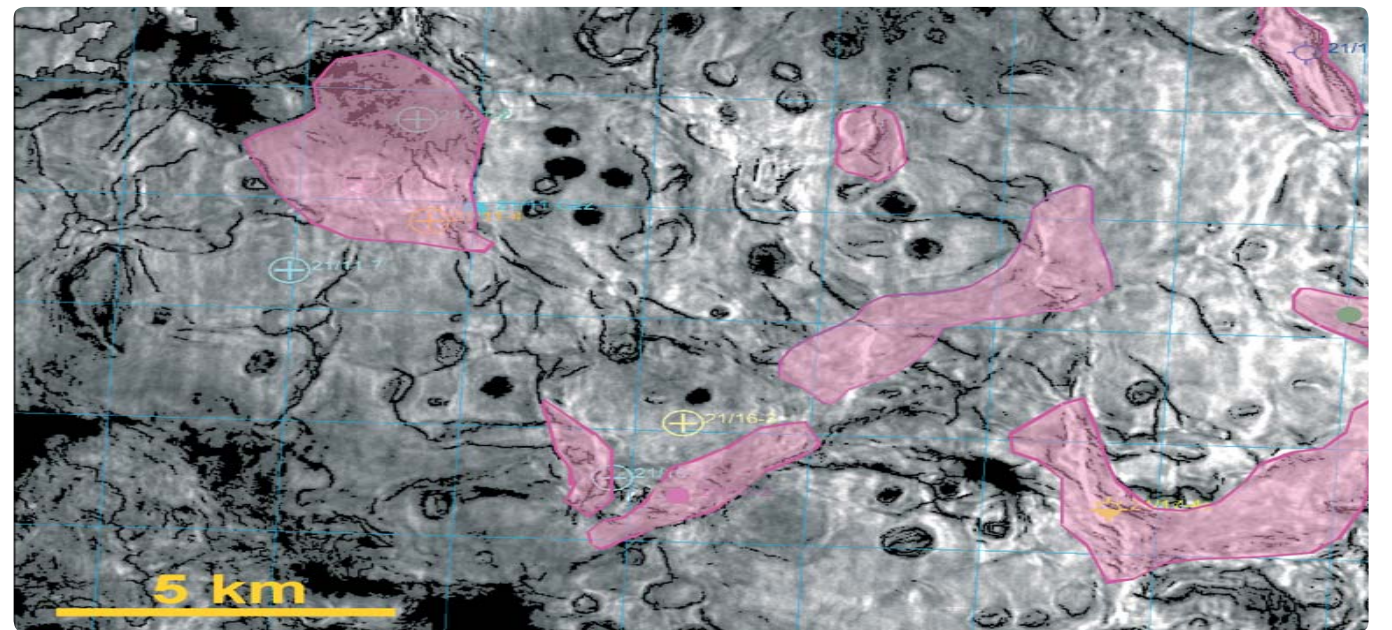
**HSE, Commercial and Supply Chain expertise operates across the development life cycle**



# Capability Case Study:

## Greater Kittiwake Area (GKA) rejuvenation

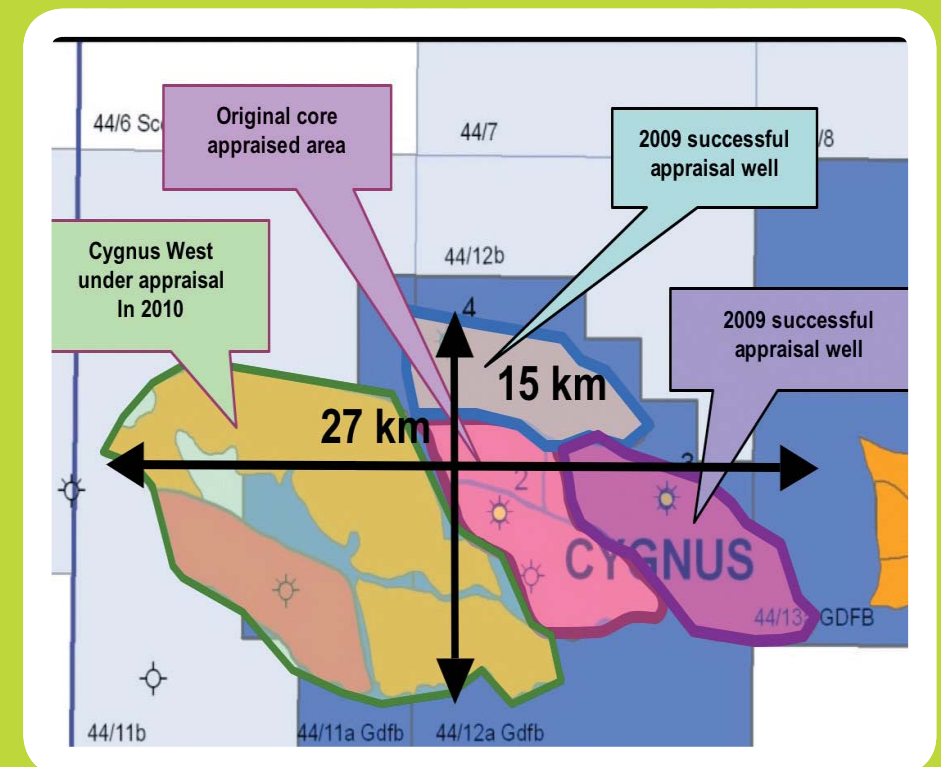
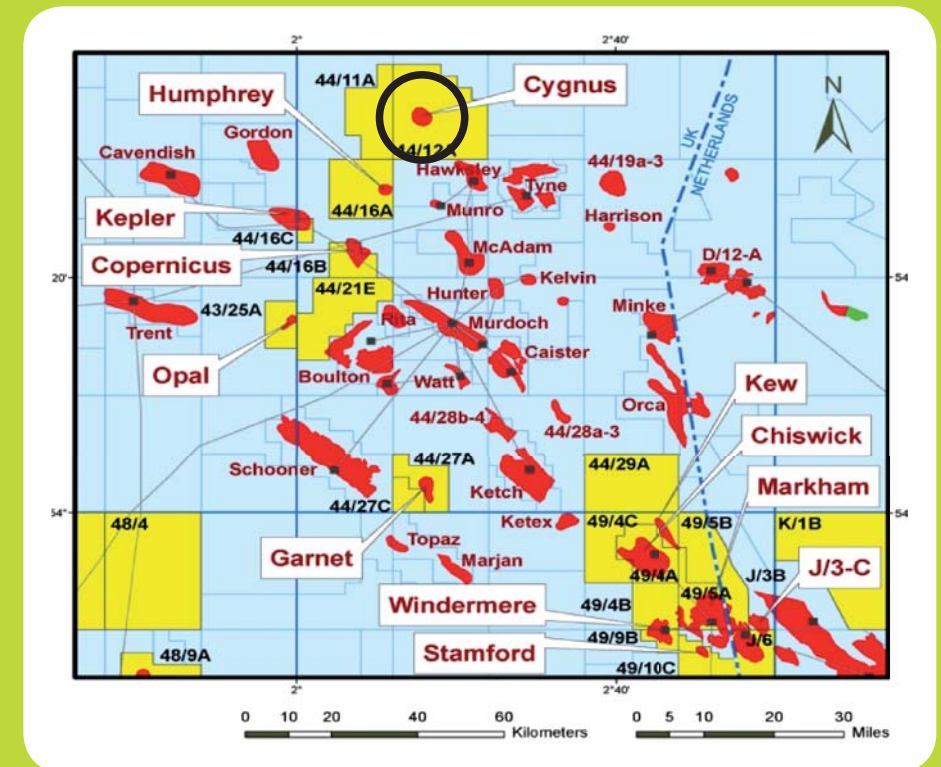
- Acquired a 50% operated interest in the GKA in 2003 – at that time production was c. 5 mboepd (gross) with abandonment in 2005
- The GKA area has been regionally mapped using 3D seismic data in order to better define and identify orphaned opportunities
- Based on technical work, 3 new fields were brought on stream (Gadwall, Goosander and Grouse) and new export pipeline constructed
- Current production is c. 25 mboepd (gross) with abandonment in 2016+
- Further growth potential in the area to be pursued





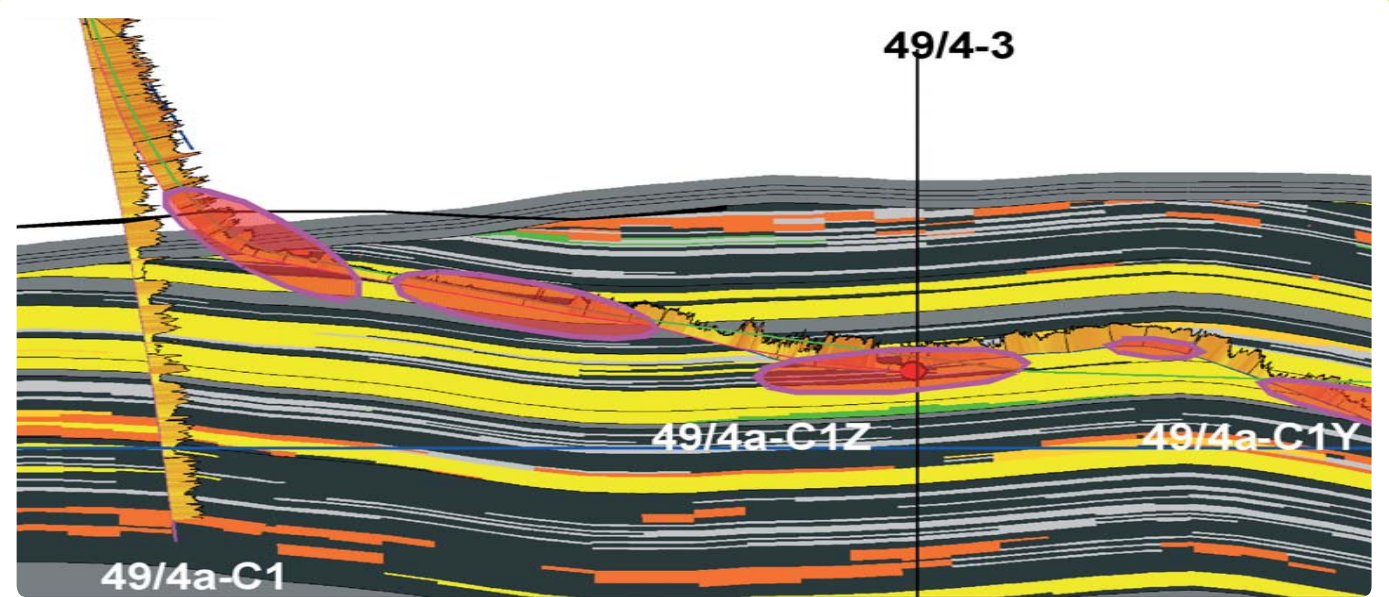
# Capability Case Study: Cygnus Field appraisal

- Discovered in 1988
- Acquired a 35% non operated interest in the Cygnus field from Tullow and a further 12.5 % interest from EON in 2008
- Drilled two successful appraisal wells in 2009, confirming the eastern field potential and unlocking this 20 year old discovery
- Two further appraisal wells to be drilled in 1H 2010 to appraise western half of the field
- One of the largest undeveloped gas discoveries remaining in the Southern North Sea with potentially up to 2 TCF of gas-in-place
- Centrica providing operator with technical support on hydraulic fracing
- Development decision targeted for late 2010 following appraisal well results
- Potential to create new hub in northern part of the Southern North Sea



# Capability Case Study: Chiswick field development

- Discovered in 1984
- Acquired in August 2006
- Chiswick drilling relied on understanding of complex carboniferous reservoir geometries and required a new technical solution for fracing the wells
- New industry project execution capability was also required to be developed
- On stream in September 2007
- Current production c. 12 mboepd
- Two further wells being drilled in 2010
- Fracing experiences now leveraged across the portfolio





# Our execution of the CE Upstream strategy has had a transformational impact on the business

## Key Elements of the Upstream Strategy



### **UK, Netherlands Offshore**

Be the leading consolidator and operator of mature and orphaned assets



### **Norway**

Partner with leading NCS operators, progress into operation



### **LNG off-taker**

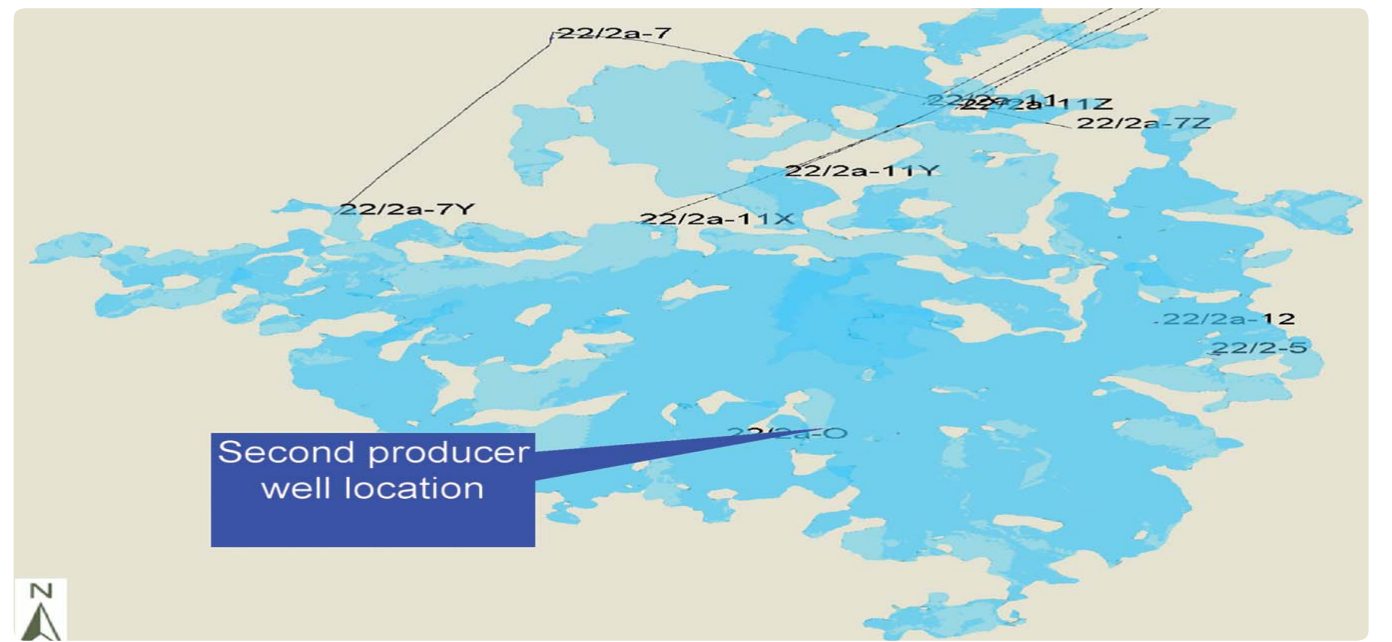
Develop LNG structures with path to direct off-take rights into the Atlantic Basin

## Progress

- Transformed CE Upstream business from 'blow down' to sustainable production
- Norway production now over 15 mboepd with first operated drilling in 2010
- Trinidad acquisition provides first producing Liquefied Natural Gas (LNG) position

# Capability Case Study: Chestnut field development

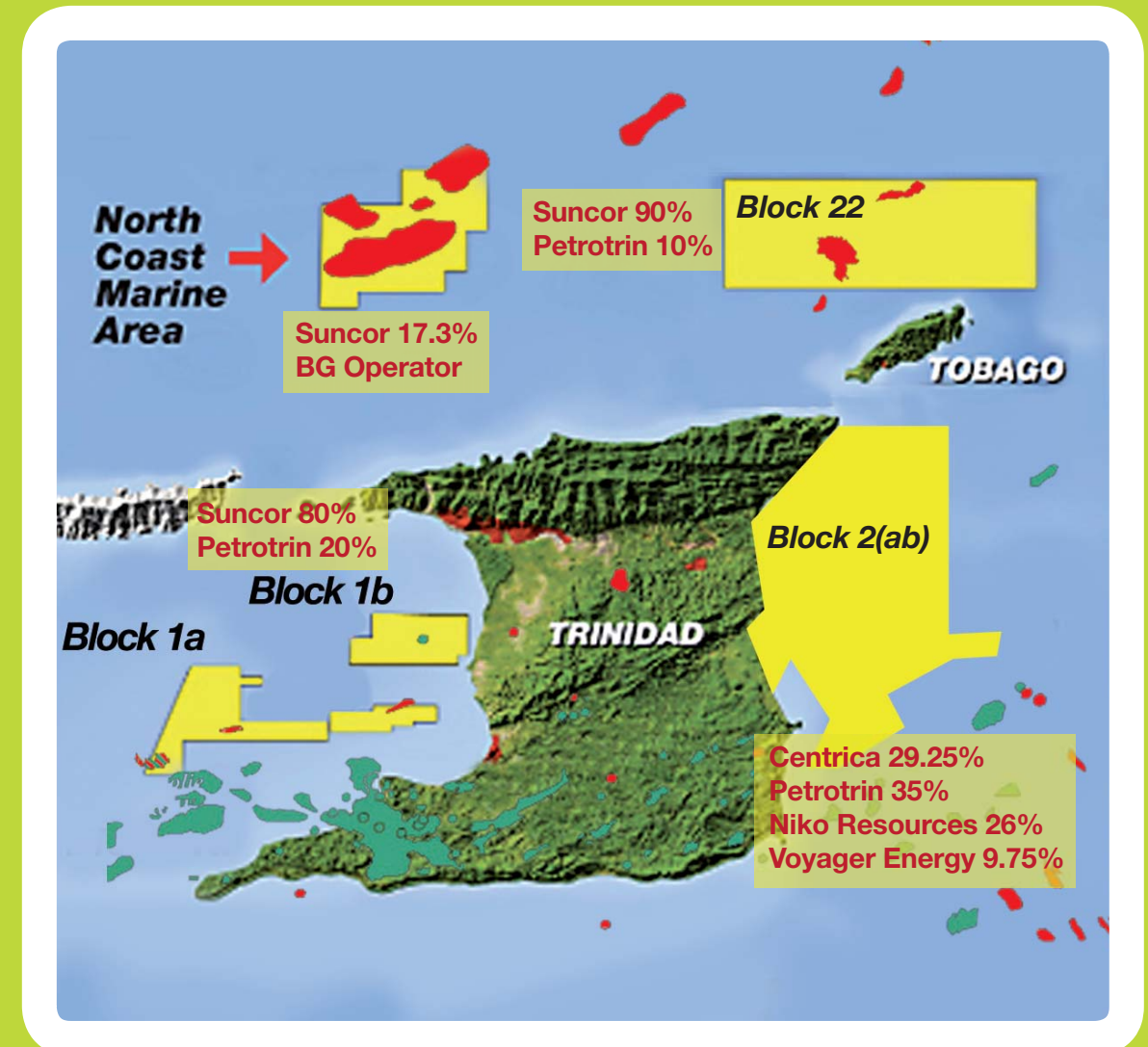
- Discovered in 1986
- Acquired in 2003
- Orphaned small oil field without access to nearby infrastructure
- Chestnut drilling relied on complex 3D seismic inversion in order to identify oil-bearing sands
- Brought on stream in 2008 with first use of a cylindrical FPSO in the North Sea
- Chestnut is currently producing c. 8 mboepd gross; almost no downtime from tanker loading
- Centrica has an option to redeploy the FPSO to another orphaned oil field after Chestnut production ceases





# Capability Case Study: Trinidad and Tobago – international growth

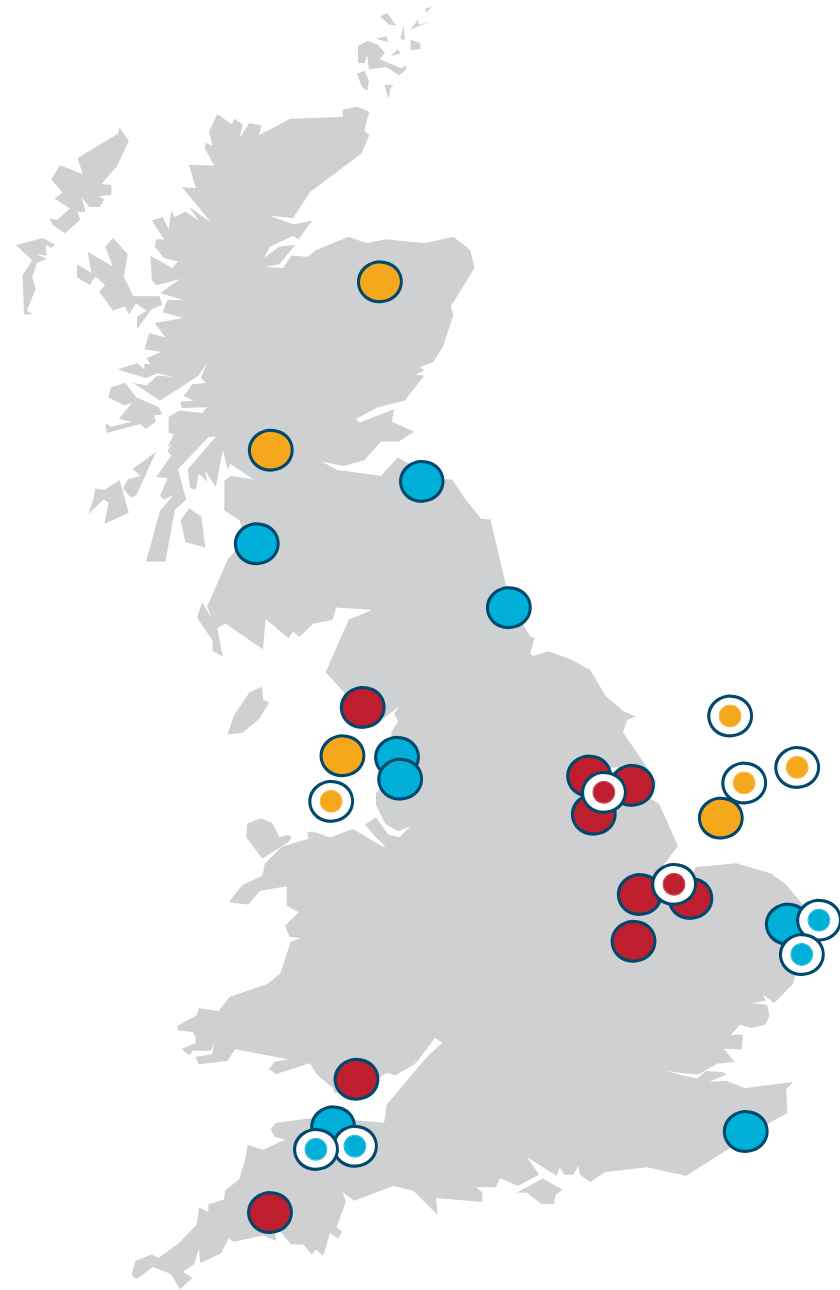
- Deal announced in February 2010 to acquire Suncor Energy's Trinidad and Tobago gas asset base
- Provides Centrica with its first producing LNG position and equity interests in 3 significant development opportunities for future, long-term LNG supplies
- Acquiring a 17.3% equity interest in producing Block NCMA-1, which supplies the Atlantic LNG facility, with working interests of 266 bcfe. Gas production of 60-70 mmscfd in 2010
- The operated gas development in Blocks 22, 1(a) and 1(b) contain an estimated 1.34 tcf of recoverable resources
- Provides access to competitively priced gas production
- LNG produced will achieve international gas prices, with further potential benefits from diversion



Trinidad is a significant exporter accounting for 60% of all LNG imported to the US



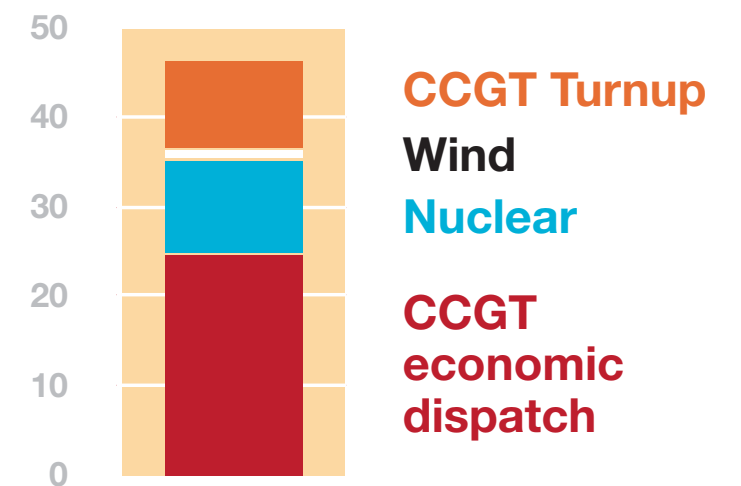
# Centrica has a diverse generation portfolio with significant growth potential



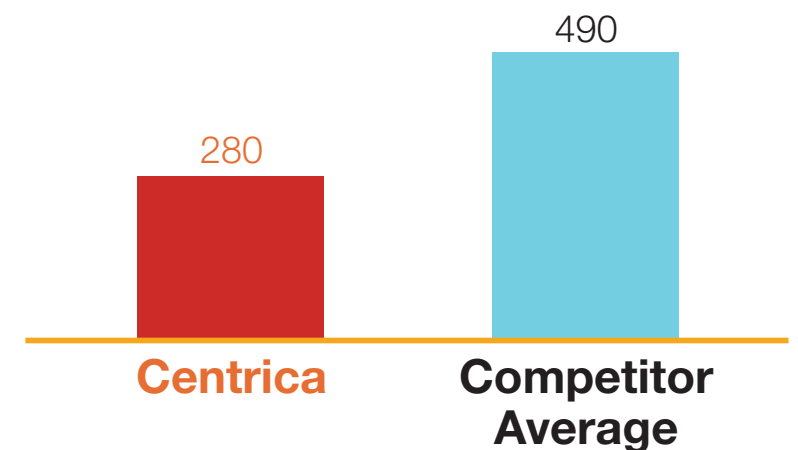
## Generation Portfolio

● Existing CCGT	4.9 GW
○ Future CCGT	~2.0 GW
● Existing Wind	0.4 GW
○ Future Wind	~5.4 GW
● Existing Nuclear	1.8 GW
○ Future Nuclear	~1.3 GW

## 2010e Generation (TWh)



## Lowest carbon intensity (2010e g/kWh)



# Our distinctive capabilities are key to delivering value from our growing business

## Gas



- Optionality to capture value from:
  - Turn up/down due to spark spread volatility
  - Balancing mechanism
  - Future requirements for ‘back-up’ due to wind intermittency
- Portfolio engineering approach resulting in higher reliability
- In-house project development team building on Langage

## Wind



- In-house turnkey capability
  - Long-term access to installation vessel (Resolution)
- Access to latest Siemens technology
- Diversified wind risk (The Wash and Irish Sea)
- Proven funding model with project financing and equity partnerships

## Nuclear

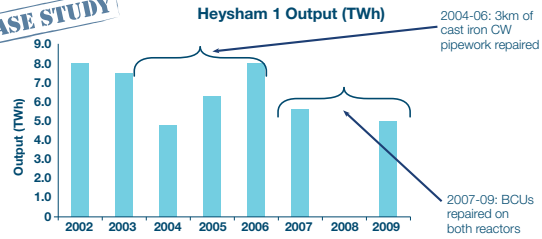


- Prime UK sites at Hinkley Point and Sizewell
- EDF as ‘Architect Engineer’
- Advanced planning and licensing
- EPR (European Pressurised water Reactor) technology



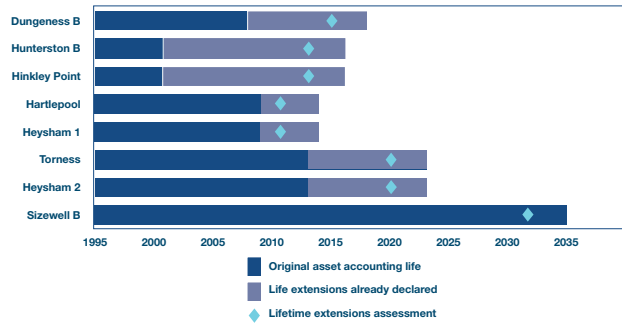
# British Energy Fleet Performance

CASE STUDY



## Fleet life extensions

Scope for possible life extensions  
Current position of BE station lifetimes



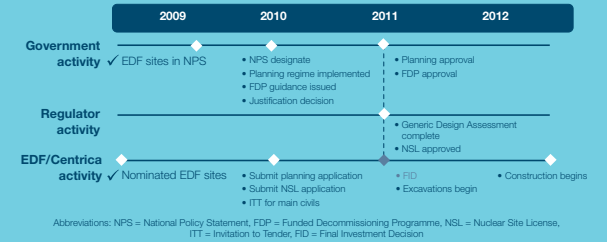
# Nuclear



## New Build Development

Key future decision is new build  
final investment decision

New build development



## EPR Advantages

The EDF/Centrica JV intends to build four 1600MW powerplants with first unit generation targeted for December 2017

### Four 1600MW EPR power plants

Proven PWR technology as a direct descendant of the reliable N4 design.  
Load following capability.  
Extended service life (60 vs 40 years).  
One of only two designs undergoing Generic Design Assessment (GDA) by the UK regulator.  
Actual plants under construction and valuable project lessons being learnt.  
Robust Fuel Cycle infrastructure.  
Flexible fuel types including MOX and stretch mixes.



### First unit at Hinkley Point planned for 2017



- 2008-10 → Development of regulatory framework
- 2009-11 → Planning application and site licensing
- 2010-11 → Preliminary Works
- 2011 → Final Investment decision
- 2011-12 → Excavation and foundations
- 2011-17 → Construction
- 2017 → Power to grid

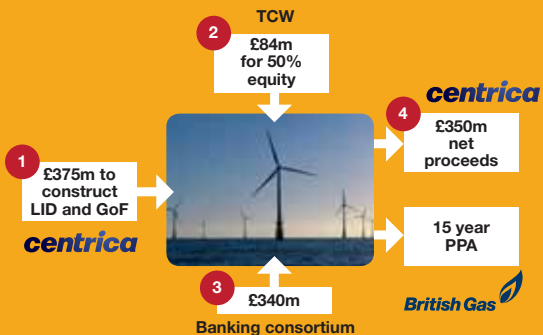
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energy**

## Lynn & Inner Dowsing: a case study

- Delivered project on time and on budget
- Project completed with an excellent safety record
- Successful execution of a multi-contract strategy
- Established and retained fully integrated and multi-disciplined project management team
- Constructed using installation vessel Resolution under long-term Centrica control

## Project Boreas: Offshore Wind Refinancing

- New sources of funding to UK Offshore market
- Club of 14 project finance banks
- Infrastructure funds as source of equity
- Release of cash from operational assets to finance construction pipeline
- Model to extend to include construction assets in the future



# Renewables



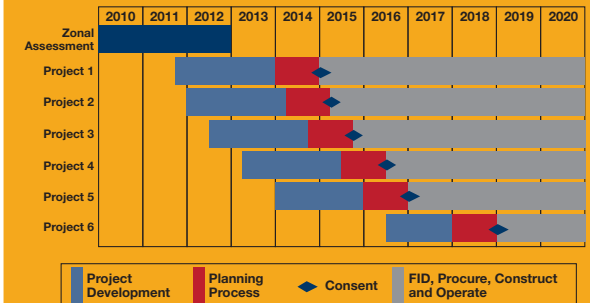
## Lincs Offshore Wind Farm

- Retained experienced project management team to progress Lincs
- Similar location and ground conditions to Lynn and Inner Dowsing
- Better understanding of risks and how to mitigate costs effectively
- Enhanced Siemens 3.6MW 120m rotor design delivering improved energy yield
- Extending crane capacity of the Resolution installation vessel
- Equity secured with DONG Energy and Siemens Project Ventures
- Continuity of contractors and major sub-contracts placed
- Will utilise existing operations and maintenance infrastructure
- Several years of successful stakeholder engagement in the Wash



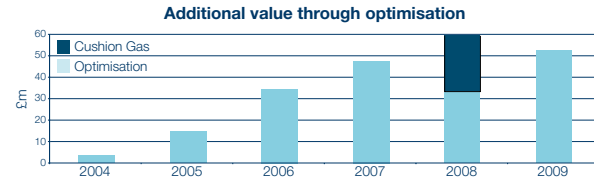
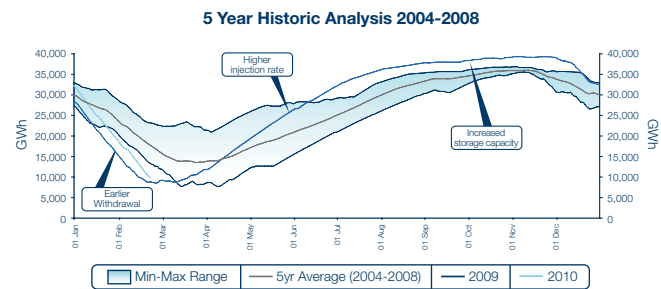
## Round 3 Irish Sea Zone

Illustrative Plan to Deliver 4.2GW of Offshore Wind



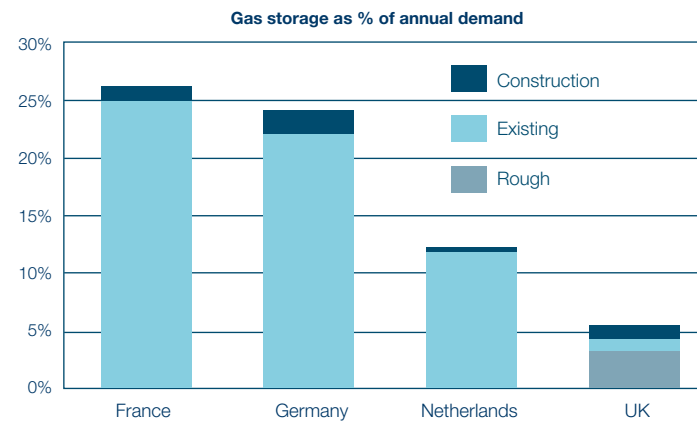


## Storage Performance



# Centrica Storage

## The case for UK gas storage



## Storage Projects

Shaping the future through flexible and reliable gas storage

	Caythorpe	Baird	Bains	Rough
<b>Description</b>	Onshore depleted gas field	Offshore existing gas field	Offshore existing gas field	Offshore depleted gas field
<b>Working Gas (bcf)</b>	7.5	60	15-20	118-128
<b>Cushion Gas Required (bcf)</b>	4	50-70	27	181
<b>Injection / production duration (days)</b>	20-30	60	60	160/70
<b>Cycles</b>	7.3	3	3	1.5



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