



The Case for Gas

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SUSTAINABLE ENERGY FUTURE

ISING ENERGY DEMAND, SUPPLY PRESSURE, CLIMATE CHANGE



9 billion
people, **75%**
living in cities

(2 billion
more than
today)



2 billion
vehicles

(800 million
at the moment)



Many **millions**
of people will
rise out of
energy poverty;
with higher
living standards
energy use rises



Energy demand
could **double**
from its level
in 2000..
.. while CO₂
emissions must be
half today's to
avoid serious
climate change

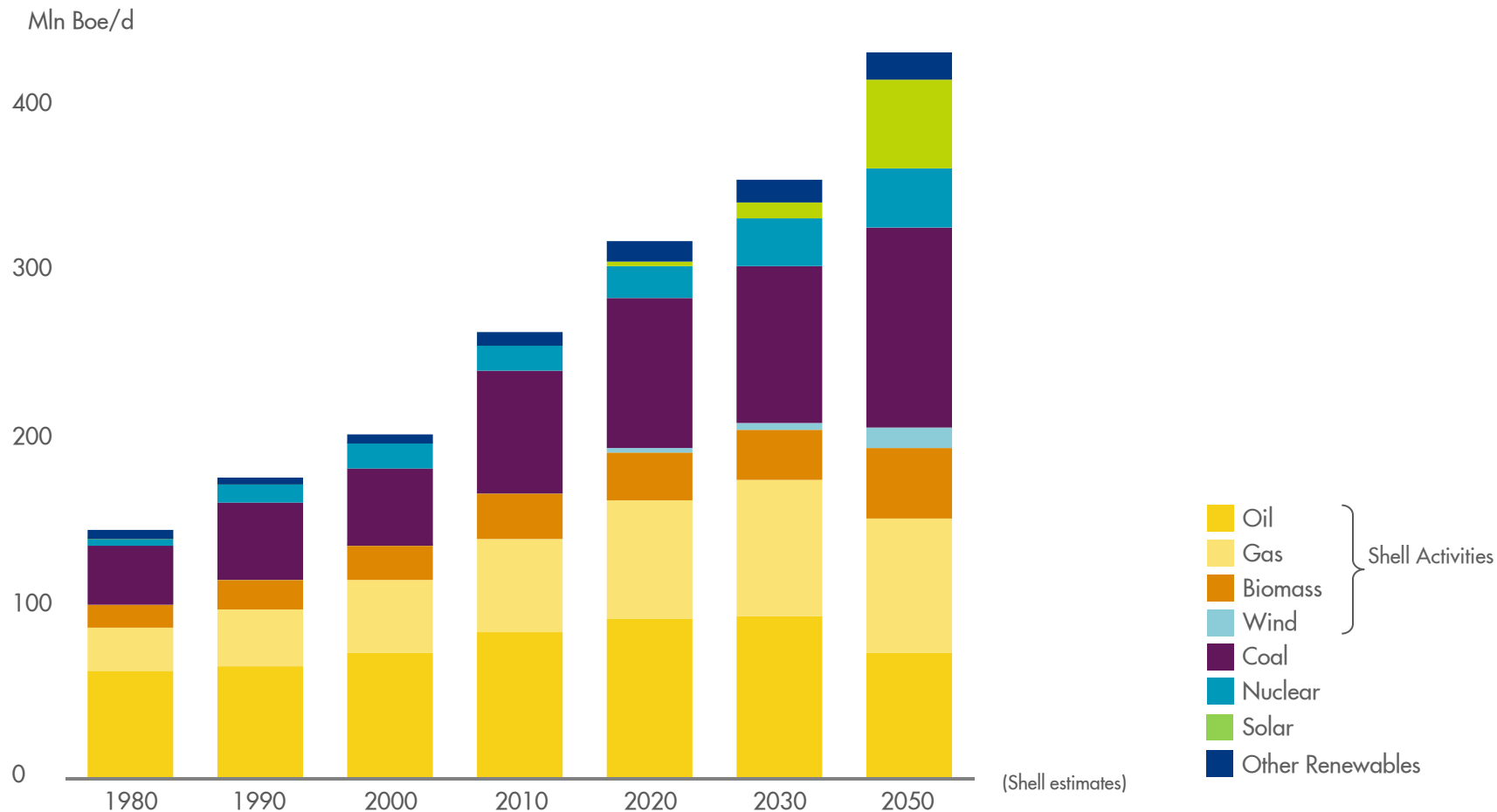


Twice as
efficient, using
half the energy
to produce each
dollar of wealth



3 times more
energy from
renewable
sources

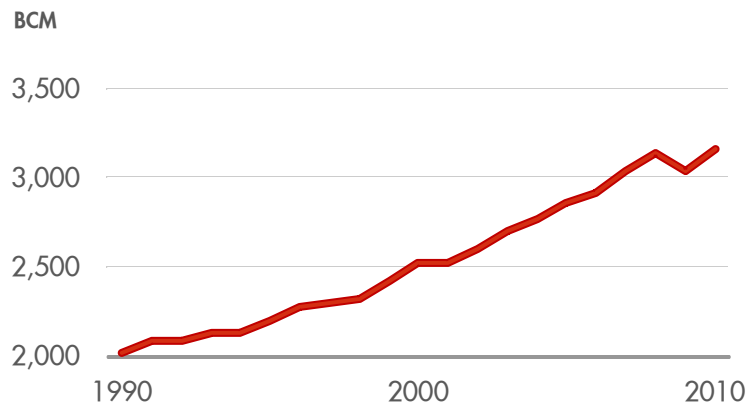
GLOBAL ENERGY MIX TO 2050



FOSSIL FUELS WILL SUPPLY MORE THAN 60% OF GLOBAL ENERGY IN 2050

NATURAL GAS OUTLOOK

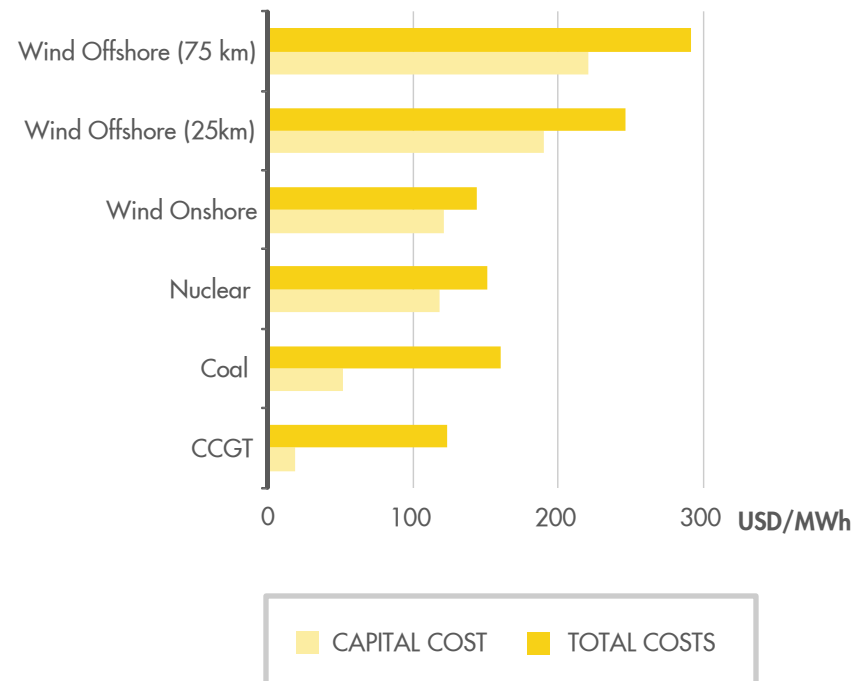
NATURAL GAS DEMAND GROWTH



NATURAL GAS ADVANTAGE: EXAMPLE CCGT

- Abundant global gas resources ~250 years reserves at current production
- **CCGT:** gas-fired power compared to coal:
 - 30% more energy efficient
 - Emit around half the CO₂
 - CCS retrofit at similar cost per MWh
 - Better complement to renewable energy

ATTRACTIVE ECONOMICS FOR ELECTRICITY PRODUCERS



CCGT: Combined Cycle Gas Turbine
Total Cost = Capital + Fuel + Operating

Source: DECC (Mott MacDonald) June 2010

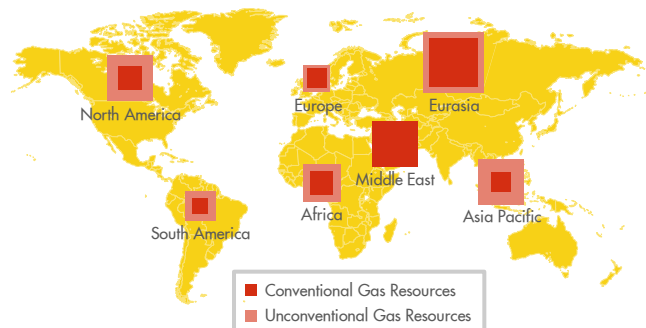
Three A's

SHELL GAS MESSAGES

THE CASE FOR GAS

ABUNDANT

- Abundant global gas resources, growing and geographically diverse
- Conventional and unconventional recoverable gas resources can supply >250 years of current global gas production

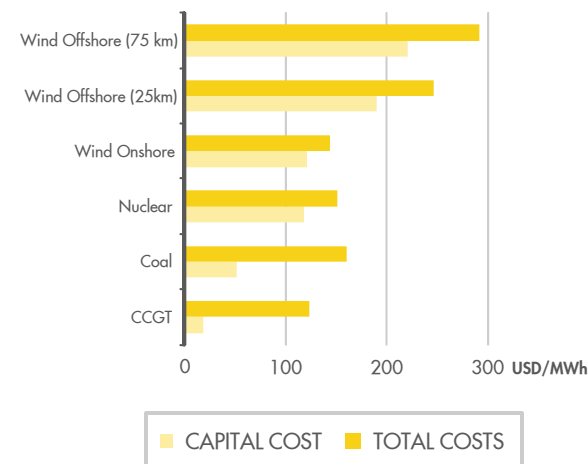


ACCEPTABLE

- **CCGT:** gas-fired power compared to coal:
 - 30% more energy efficient
 - Emit around half the CO₂
 - CCS retrofit at similar cost per MWh
 - Better complement to wind power
- Replacing coal with gas for electricity generation is the cheapest and fastest way to meet CO₂ reduction targets

AFFORDABLE

- CCGT cheapest to build
- Similar total cost to coal and nuclear



NATURAL GAS: A DESTINATION FUEL

Source: IEA World Energy Outlook, WoodMackenzie, Shell Interpretation

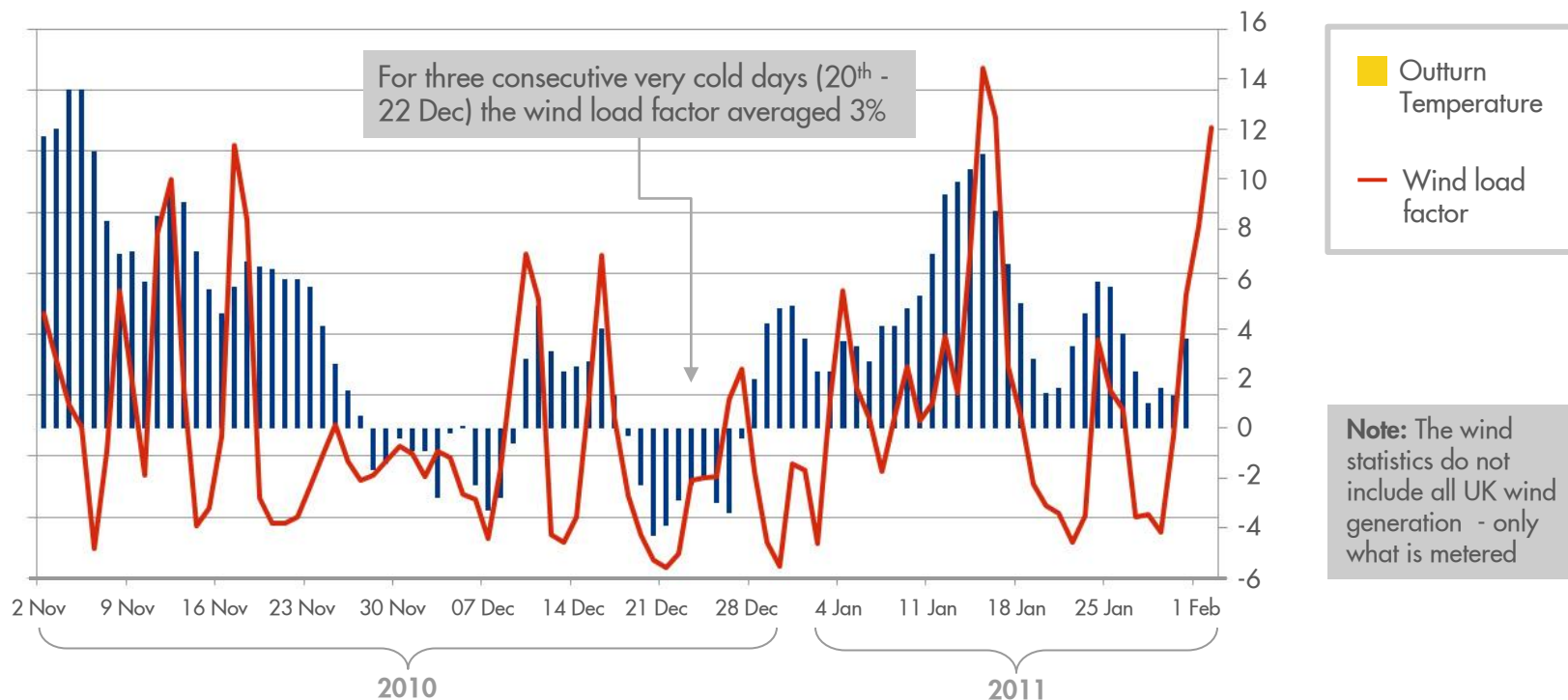
CCS: Carbon Capture & Storage

CCGT: Combined Cycle Gas Turbine
Total Cost = Capital + Fuel + Operating

Source: DECC (Mott MacDonald) June 2010

GAS AS SUPPORT FOR RENEWABLES

AVAILABILITY OF UK WIND GENERATION



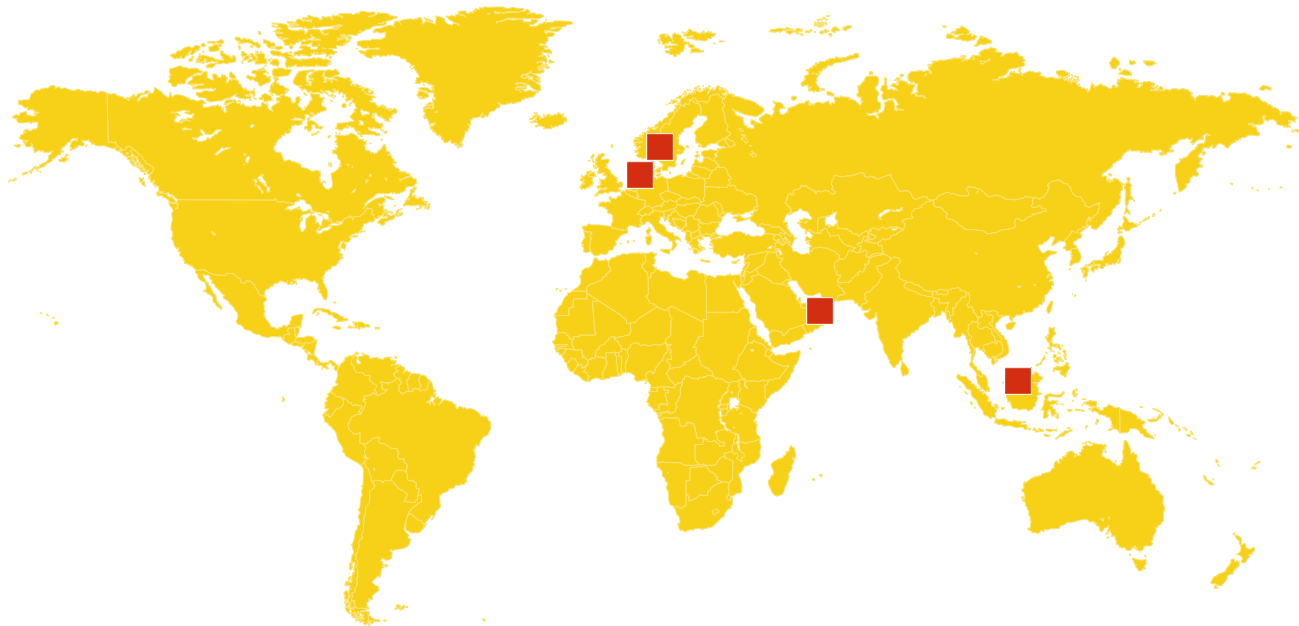
- Gas is the natural complement to intermittent renewable energy
- There is a strong interdependency between gas and renewable energy due to its flexibility, its role as back-up and as storage



SHELL

AND GTL

GTL: FROM LABORATORY TO WORLD-SCALE



SHELL: 30+ YEARS GTL DEVELOPMENT

OPPORTUNITY FOR A GAS REVOLUTION

Benefits of “Golden age of Gas” possible with:

- Level playing field for gas
- Robust Emissions Trading Scheme
- Government support for CCS projects
- Adequate regulation of tight and shale gas

THANK YOU