



# MAKING ENERGY TRANSITION

Role of gas and low carbon electricity

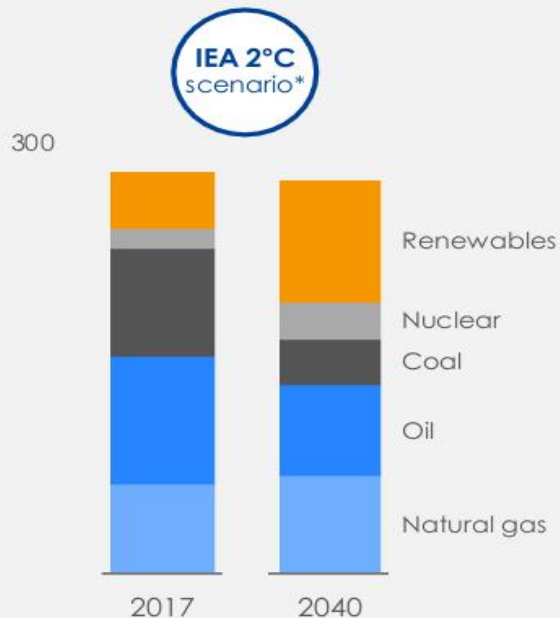


# Integrating climate into strategy

Taking into account anticipated market trends

Global energy demand

Mboe/d



\* IEA Sustainable Development Scenario

Focusing on **oil** projects with **low breakeven**



Expanding along the **gas value chain**



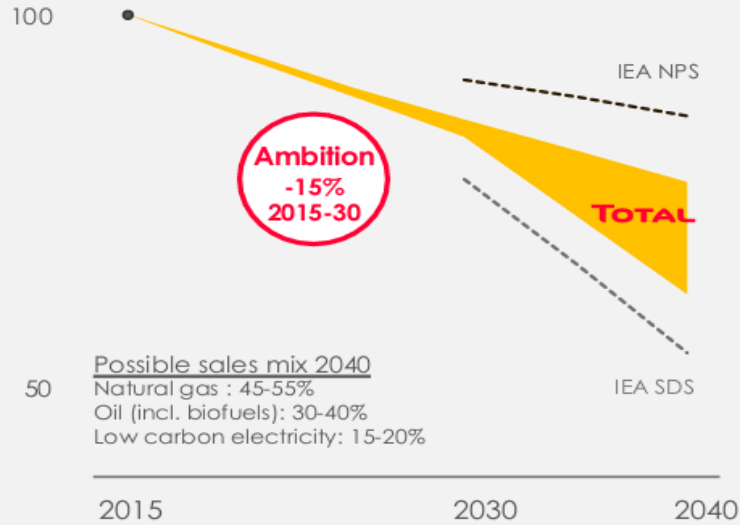
Developing profitable & sizeable **low carbon electricity** business



# Our ambition: strategy contributing to tackle climate change

## Reducing the carbon intensity of our energy sales

Carbon intensity: weighted average of lifecycle\* emissions of energy products sold  
Base 100 in 2015 (75 gCO<sub>2</sub>/kbtu)



Further improving **efficiency** of our **operations**

Growing in **natural gas**

Developing a profitable **low carbon electricity** business

Promoting sustainable **biofuels**

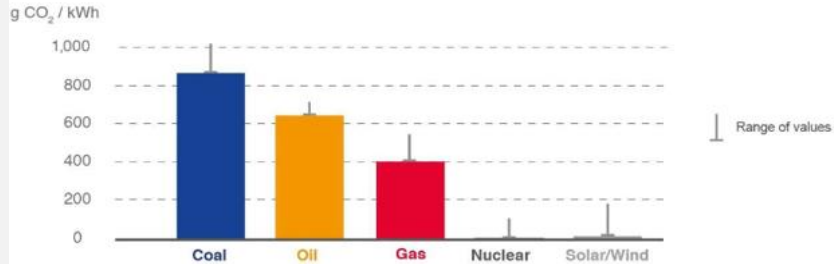
Investing in **carbon sink businesses**  
(natural sinks & CCUS)

NPS: New Policy Scenario ~2.7°C by 2100  
SDS: Sustainable Development Scenario ~2°C by 2100  
\* Scopes 1, 2 & 3

# Natural gas as a factor of sustainable development

## IN POWER GENERATION, NATURAL GAS EMITS ONLY HALF AS MUCH AS COAL

Greenhouse gas emissions  
from power generation, by technology

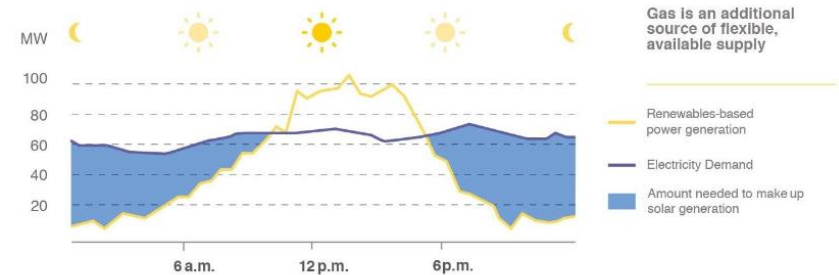


Source: IEA CO<sub>2</sub> Emissions From Fuel Combustion 2014  
IPCC, Fifth Assessment Report (AR5), WG3 Annex II, Table A,  
III.2, 2014.

**Energy Intensive** like coal  
Twice **less polluting** than coal

## NATURAL GAS PERFECTLY PARTNERS VARIABLE RENEWABLES

Daily Electricity Demand Curve and Solar's Contribution

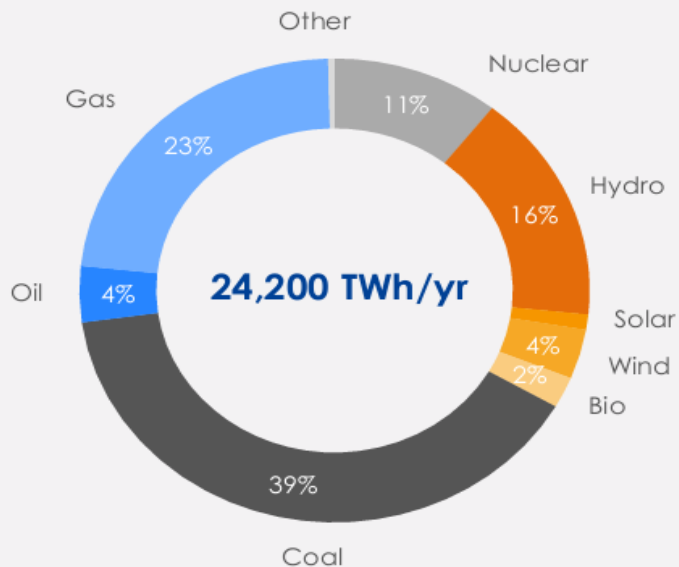


**More flexible** than nuclear  
**No intermittency** problem

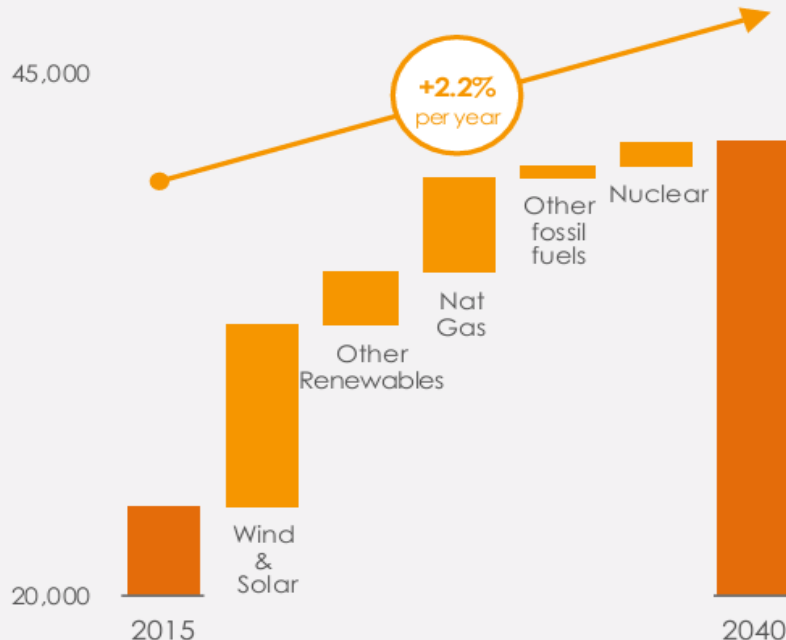
# Power generation: more low carbon electricity

## Hydrocarbon share of generation falls to half in 2040

2015 global power generation  
%, TWh/yr



Global power generation  
TWh/yr



**Renewables** and **natural gas** dominating growth  
Decrease of **carbon intensity** by one third

# Low carbon power generation

Natural gas and renewable energy sources are complementary

## Natural gas as a fuel for energy transition

Still need highly intensive energy source

With multiple uses (transport, heating, electricity)

Answering to intermittency problem

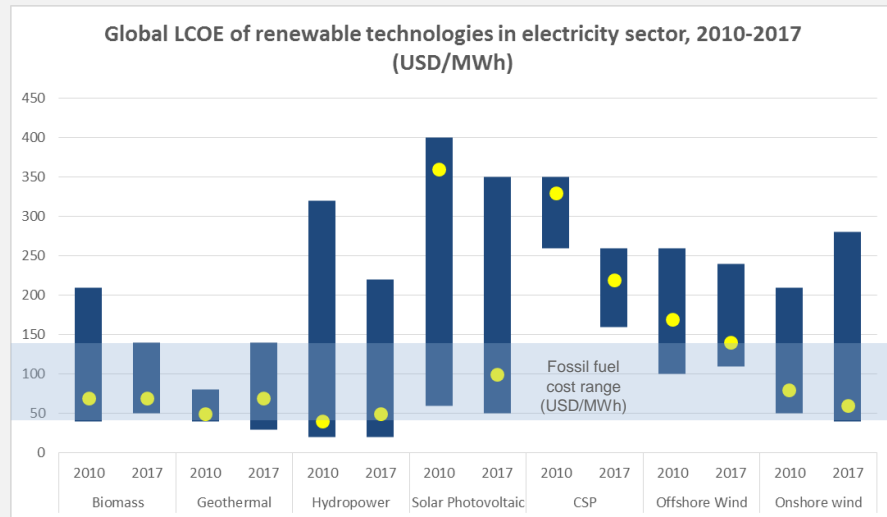
## Increase of the share of renewables

Increasing productivity yields

Less greenhouse gases emissions

With high carbon price, profitability assessment is more favorable

Allow for decentralized energy production



Source: International Renewable Energy Agency (IRENA)