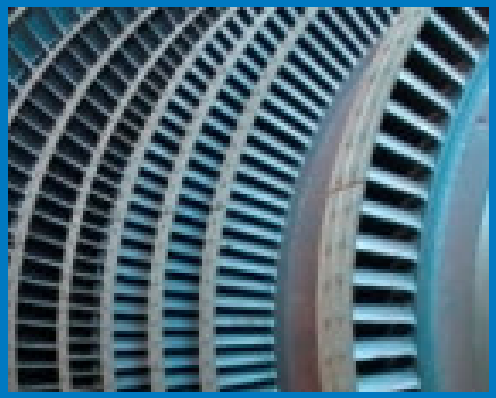
nationalgrid

Power Generation


Lilian Macleod
Power Supply Manager
National Grid

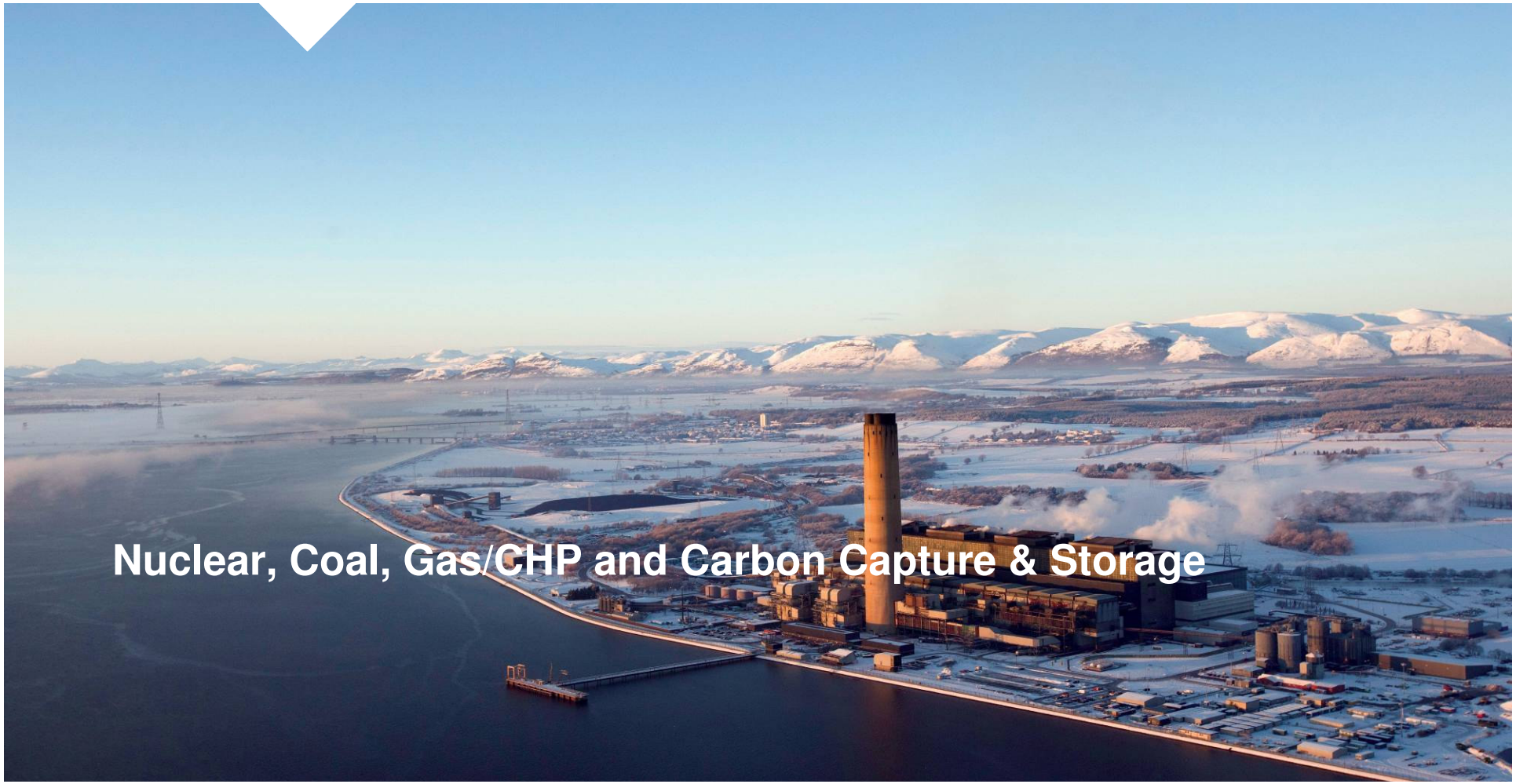
nationalgrid

Power Generation – Factors We Consider

- Climate Change Targets & Legislation
- Government Policy & Initiatives
- Market Intelligence and Project Status
- Technology

nationalgrid

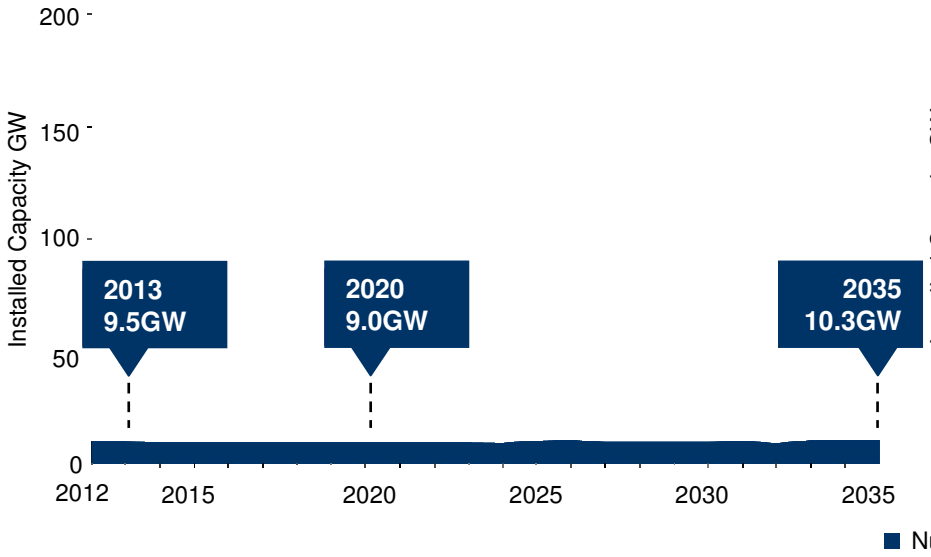
Power Generation Capacity – Part 1



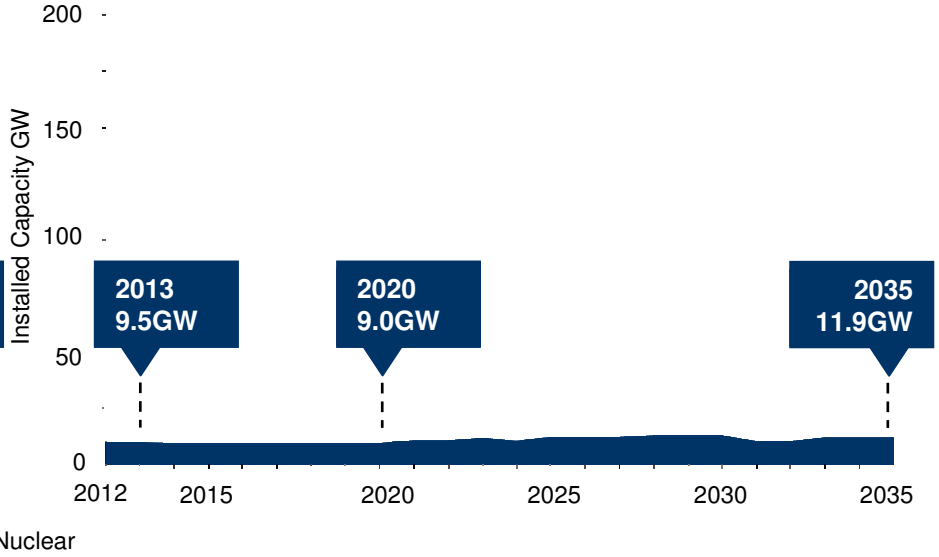
Power Generation Capacity: Nuclear

nationalgrid

Slow Progression



Gone Green



Nuclear

Duration Of Life Extension For Existing Power Stations

Average 10 Year Life Extension

Average 7 Year Life Extension

Connection Date Of First New Power Station

Connecting Mid 2020

Connecting Early 2020

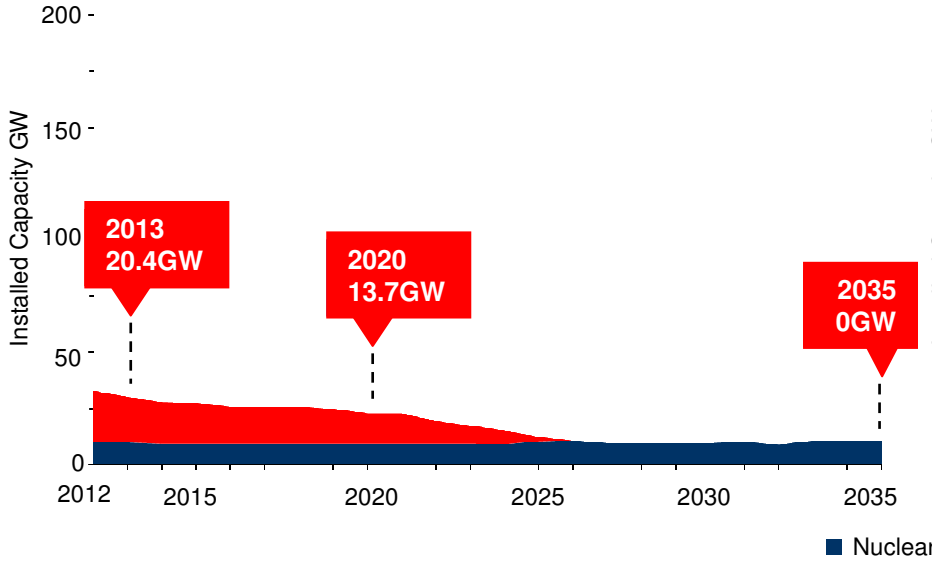
Contract for Difference – Strike Price

Announcement Pending

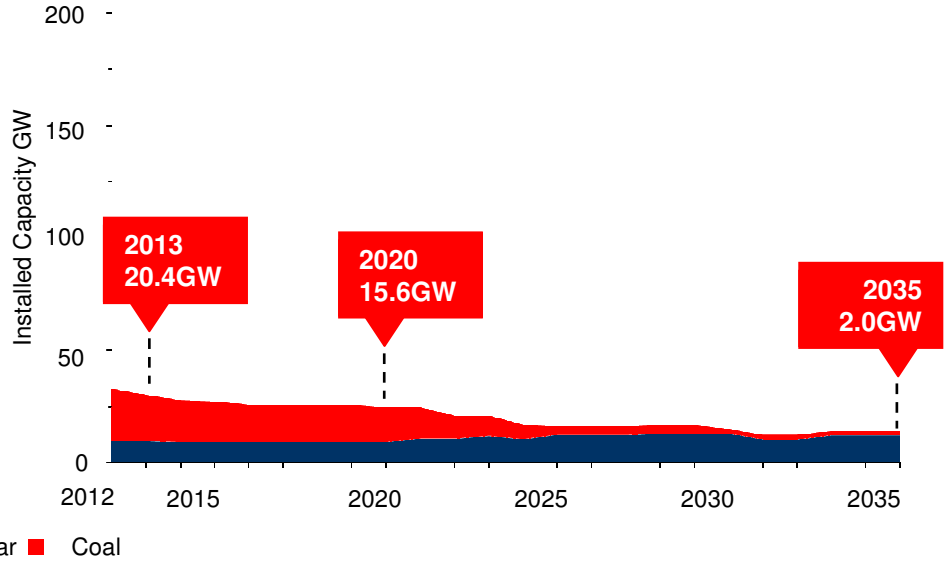
Power Generation Capacity: Coal

nationalgrid

Slow Progression



Gone Green



Nuclear Coal

Impact of Environmental Legislation – Industrial Emissions Directive

Majority Of Plant Opt Out Of IED

Broader Range of IED Outcomes

Conversion To Biomass

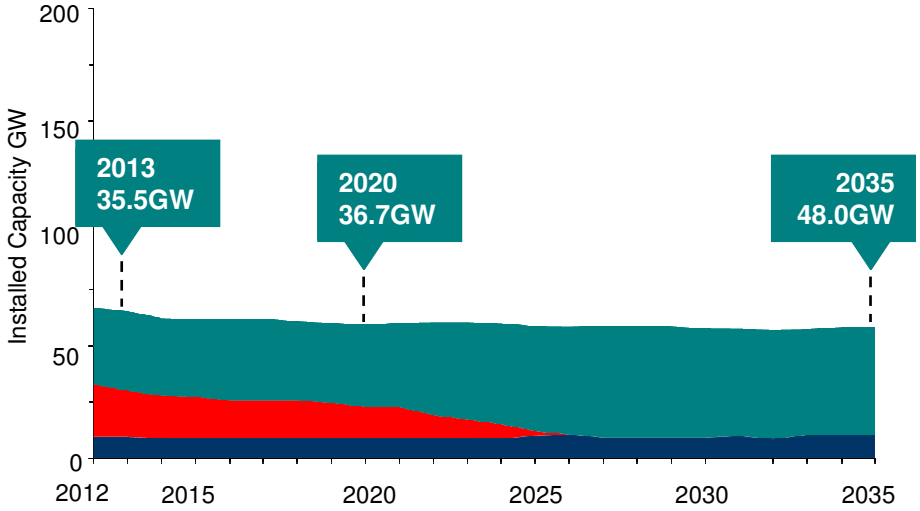
Consideration Of Biomass Conversion

Emphasis on Biomass Conversion

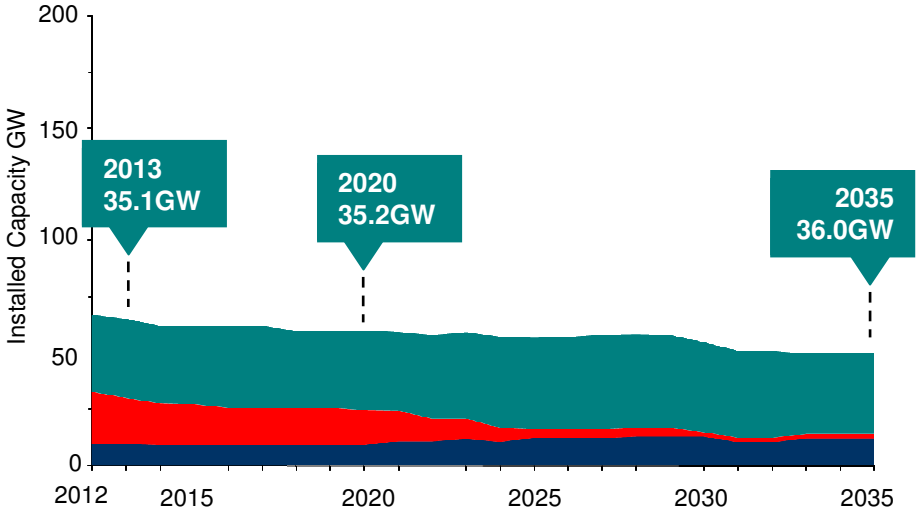
Power Generation Capacity: Gas/Combined Heat & Power (CHP)

nationalgrid

Slow Progression



Gone Green



Nuclear Coal Gas/CHP

Lifespan of Existing Power Stations

Most Existing Plant Open Out To 2020

Plant Closures Off-Set By New Plant

Level of Renewable Generation

Renewable Mix & Utilisation of Gas Plant

Emphasis On Renewable Generation

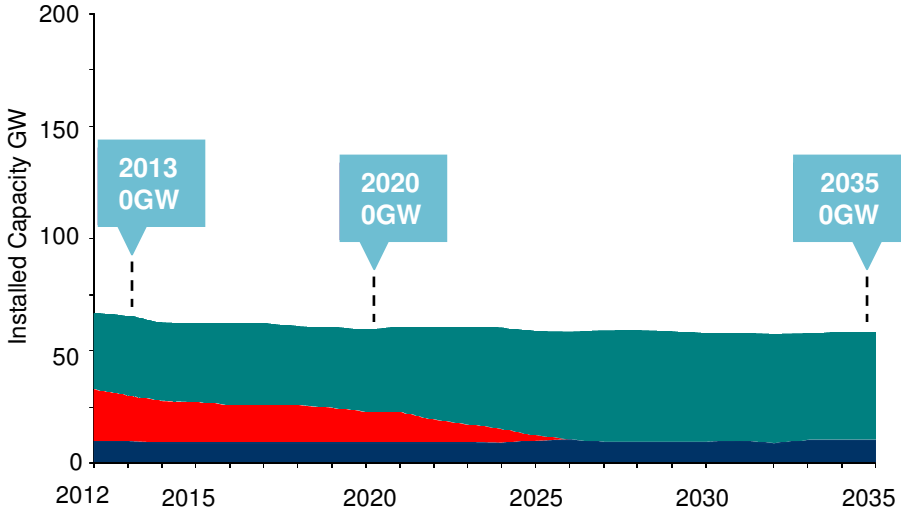
Capacity Mechanism

Payment Received Under Capacity Mechanism – 1st Auction in 2014 for 2018/19

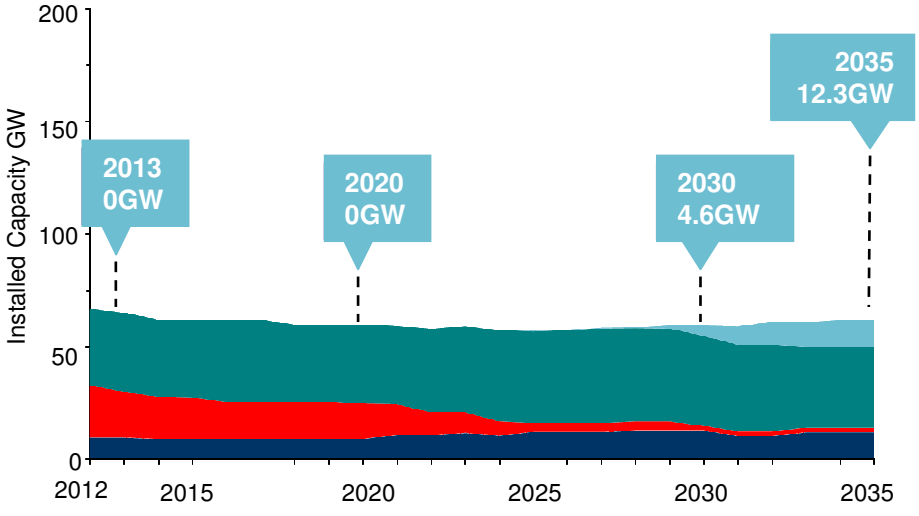
Power Generation Capacity: Carbon Capture & Storage (CCS)

nationalgrid

Slow Progression



Gone Green



Nuclear Coal Gas/CHP CCS

Commercialisation Of Carbon Capture & Storage

CCS Not Commercially Viable for Coal & Gas

CCS for Coal, Gas and Biomass

Contract for Difference – Strike Price

Announcement Pending

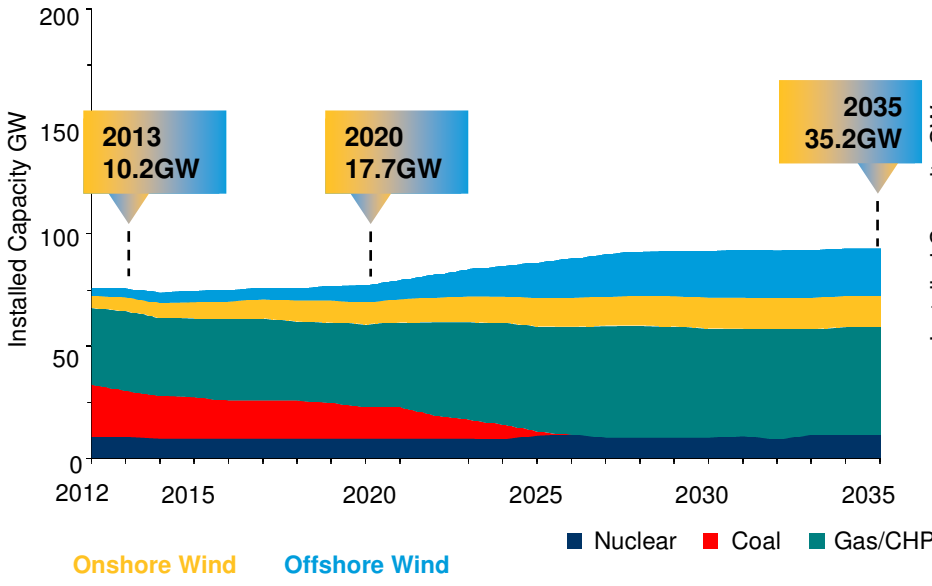
nationalgrid

Power Generation Capacity – Part 2

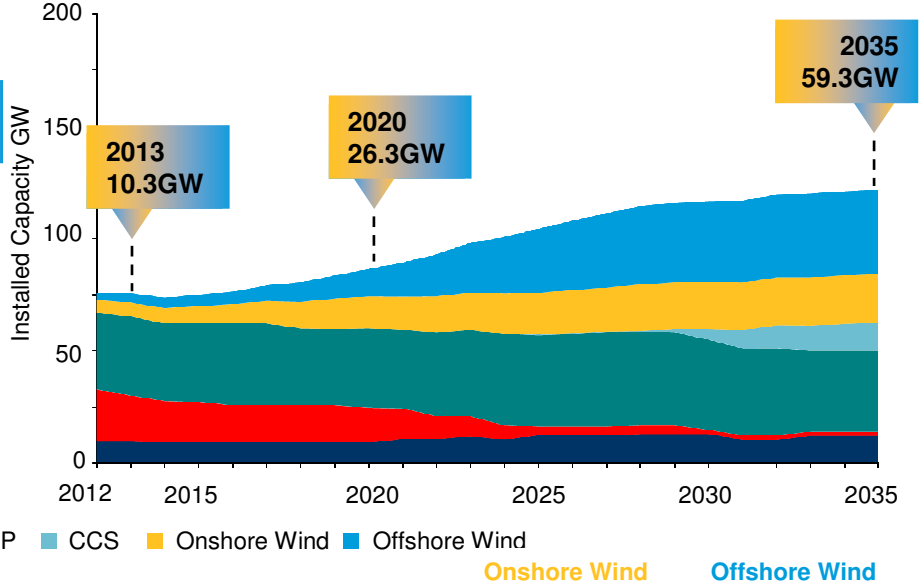
Power Generation Capacity: Wind – Onshore & Offshore

nationalgrid

Slow Progression



Gone Green



Level of Renewable Generation and Associated Technology

Increase Over Period and Compared to 2012 Scenarios

@ 2020 - 10.1GW (Onshore) & 7.5GW (Offshore)
@2035 - 13.9GW (Onshore) & 21.3GW (Offshore)

Onshore Wind: Higher Increase Compared to 2012 Scenarios
Offshore Wind: Lower Levels @ 2020 Compared to 2012 Scenarios

@2020 - 14.2GW (Onshore) & 12.1GW (Offshore)
@2035 – 21.8GW (Onshore) & 37.5GW (Offshore)

Contract for Difference – (Draft) Strike Price

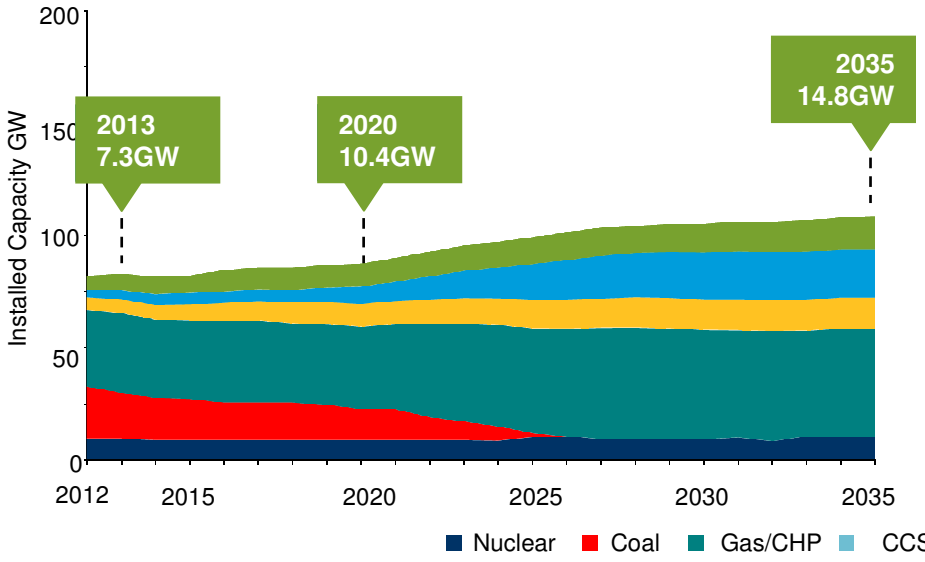
Onshore Wind - £100 to £95 MWh (2014/15 & 2018/19)

Offshore Wind - £155 to £135 MWh (2014/15 & 2018/19)

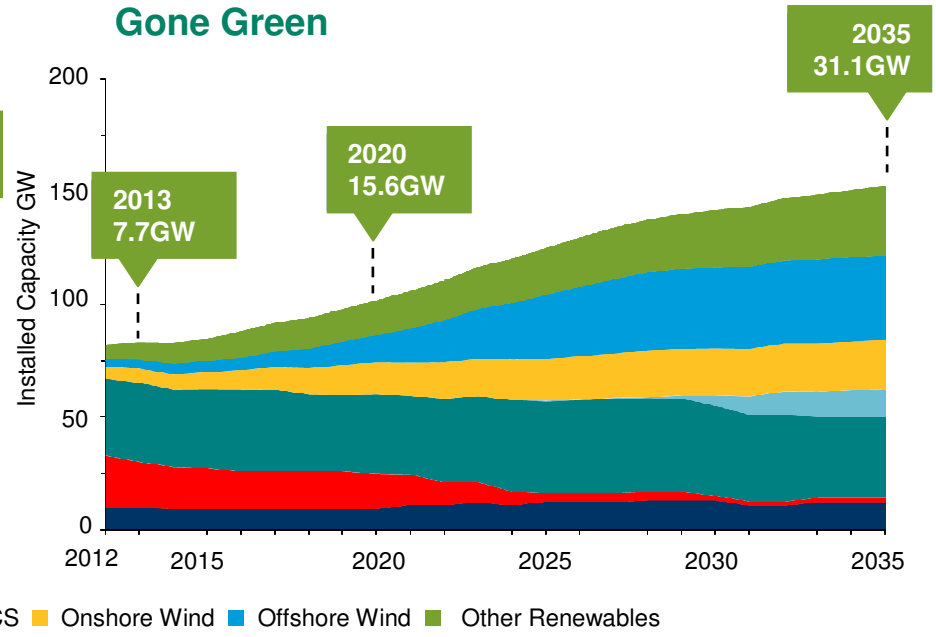
Power Generation Capacity: Other Renewables – Biomass, Hydro, Marine & Solar PV

nationalgrid

Slow Progression



Gone Green



Nuclear | Coal | Gas/CHP | CCS | Onshore Wind | Offshore Wind | Other Renewables

Government Incentives

Modest Levels of Biomass & Solar PV

Increased Emphasis on Biomass & Solar PV

Technology Development

Slow Development of Marine Technology

Commercial Deployment of Marine Technology

Contract For Difference – (Draft) Strike Price

Biomass Conversion - £105 MWh

Dedicated Biomass CHP - £120 MWh

Hydro - £95 MWh

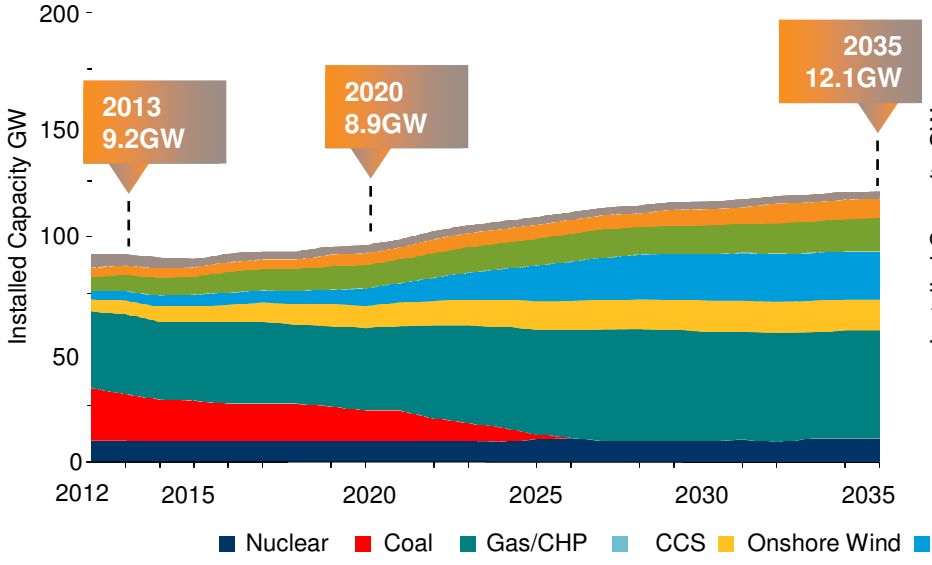
Wave & Tidal - £305 MWh (≤30MW)

Solar PV - £125 to £110 MWh (2014/15 & 2018/19)

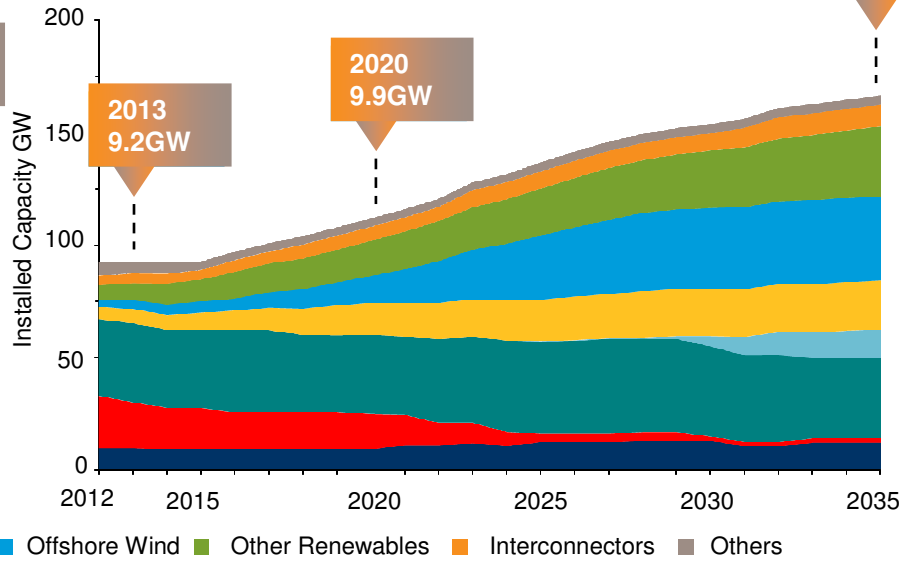
Power Generation Capacity: Interconnectors & Others (Pumped Storage & Oil)

nationalgrid

Slow Progression



Gone Green



Nuclear | Coal | Gas/CHP | CCS | Onshore Wind | Offshore Wind | Other Renewables | Interconnectors | Others

Interconnectors Others

Interconnectors Others

Government Policies

Increased Interconnector Capacity

Higher Interconnector Capacity

Impact of Environmental Legislation

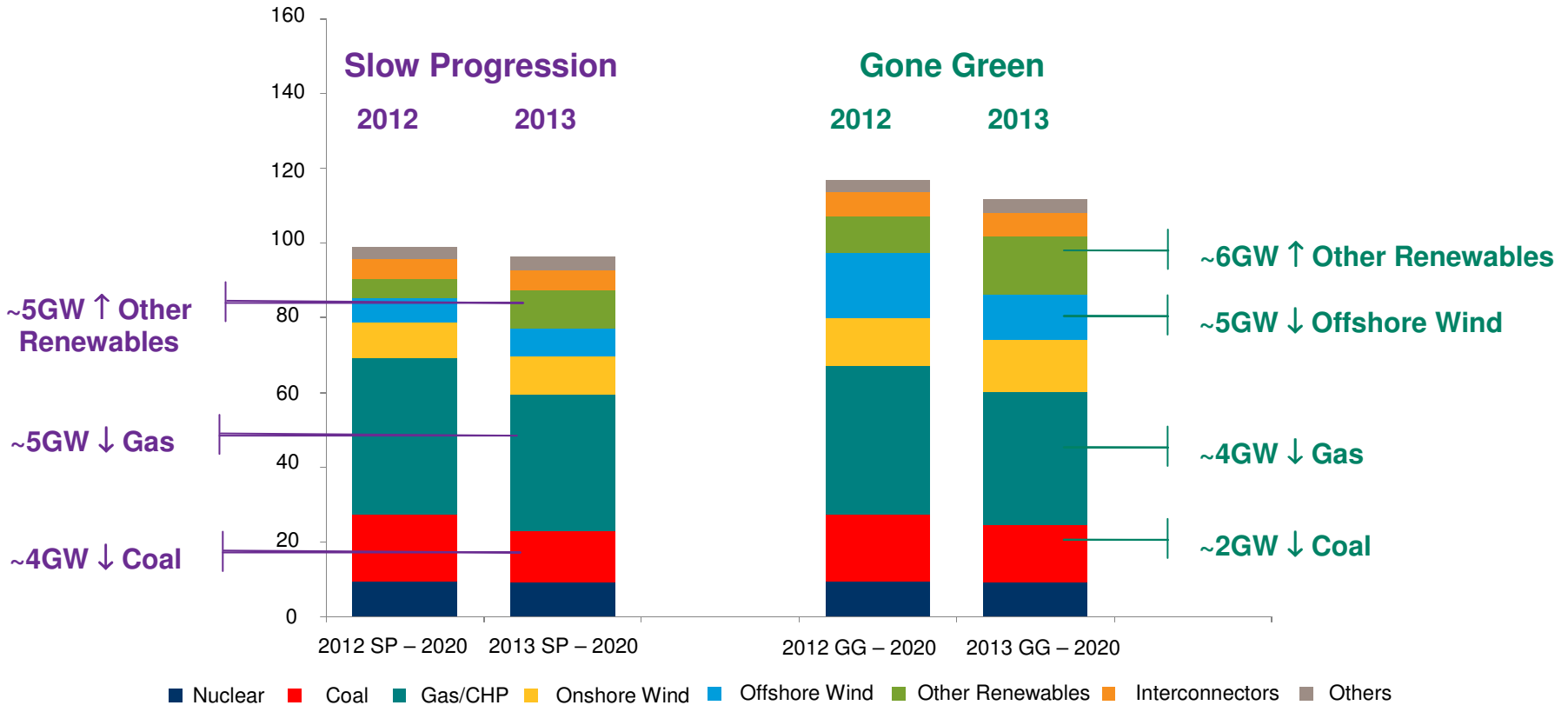
Reduction In 'Oil' Plant Capacity

nationalgrid

Power Generation Capacity: Comparison @ 2020

Power Generation Capacity: Comparison @ 2020 (2012 vs 2013 Scenarios)

nationalgrid



Climate Change Targets & Legislation

Government Policy & Initiatives

Market Intelligence & Project Status

Technology

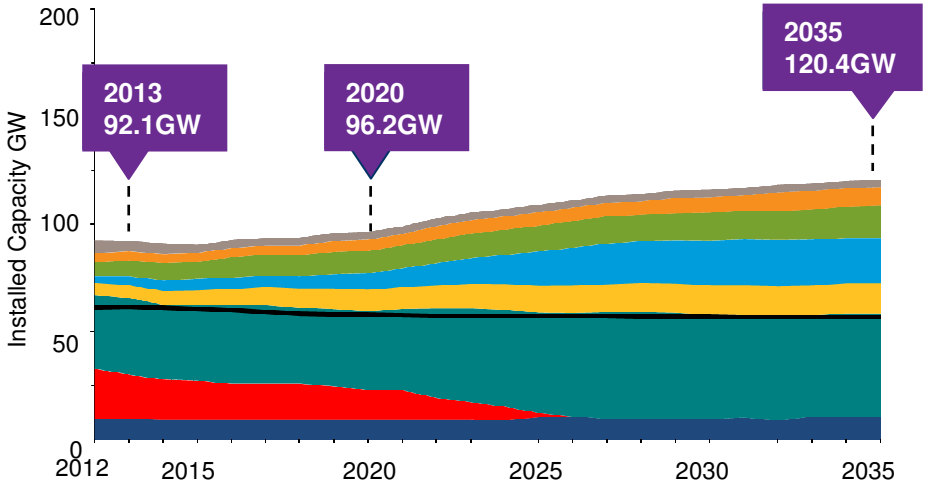
nationalgrid

Power Generation:
What Needs To Happen?

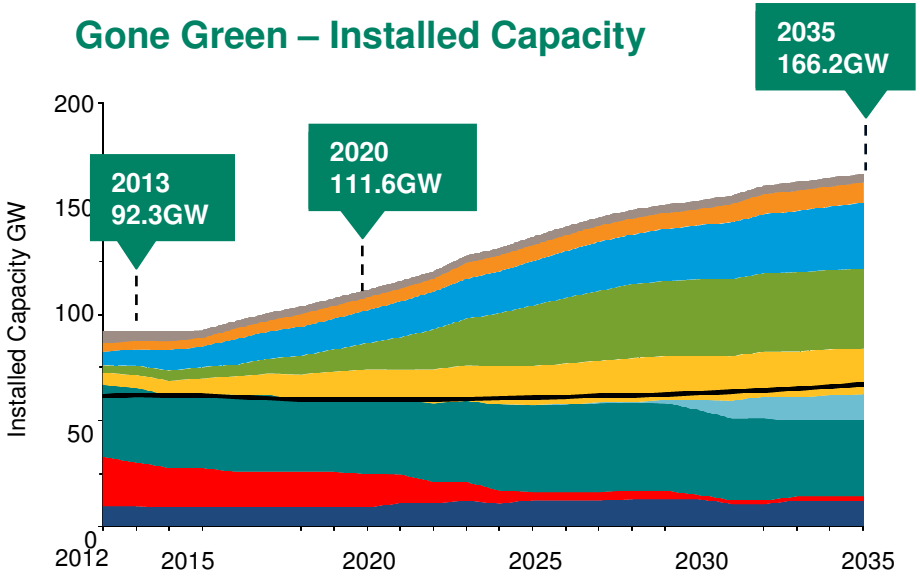
Power Generation: What Needs To Happen?

nationalgrid

Slow Progression – Installed Capacity



Gone Green – Installed Capacity



Nuclear | Coal | Gas/CHP | CCS | Onshore Wind | Offshore Wind | Other Renewables | Interconnectors | Others | Transmission Peak Demand

- Biomass: Sustainable Sources of Material
- Wind Deployment: Consents, Support & Finance
- Effective Supply Chain for Offshore Wind
- Life Extensions/Span of Existing Power Stations
- Commercial Deployment of New Technologies
- EMR To Be Implemented
- Networks Developed To Connect New Generation