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DEPARTMENT OF ENERGY & CLIMATE CHANGE

Decarbonising the UK Energy Market

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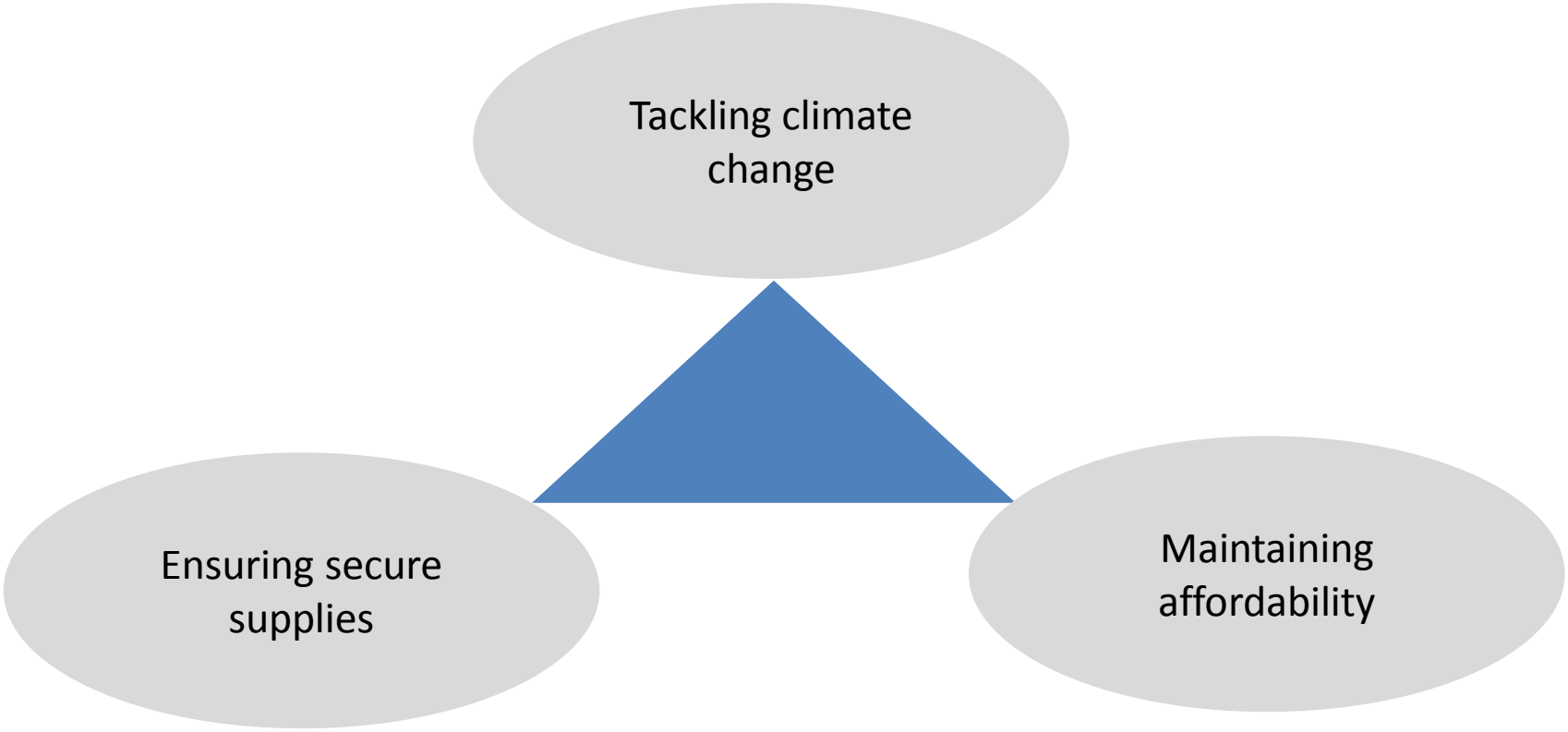
Our objectives - to achieve secure, low carbon, affordable electricity

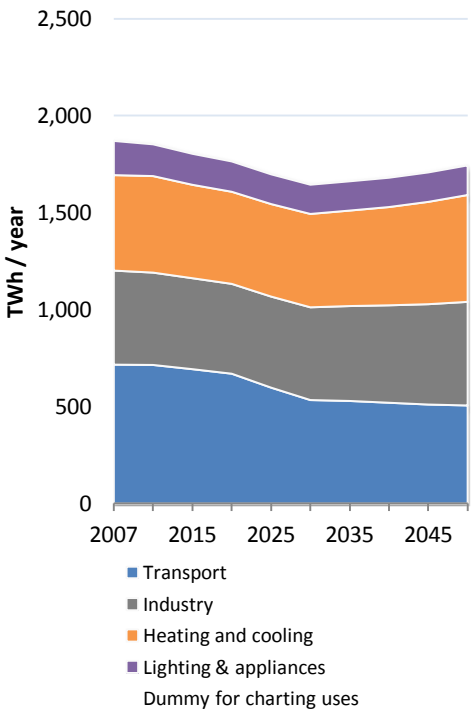


Climate change goals: 80% emissions reduction (from 1990) by 2050 and 5 year carbon budgets, 15% renewable energy by 2020

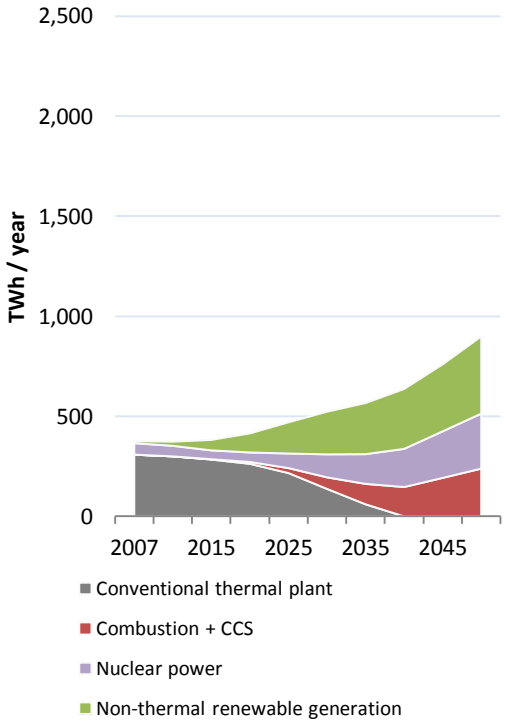
We have a huge investment challenge to support a low carbon secure future

EXAMPLE PATHWAY – THERE ARE MANY OTHER POSSIBILITIES

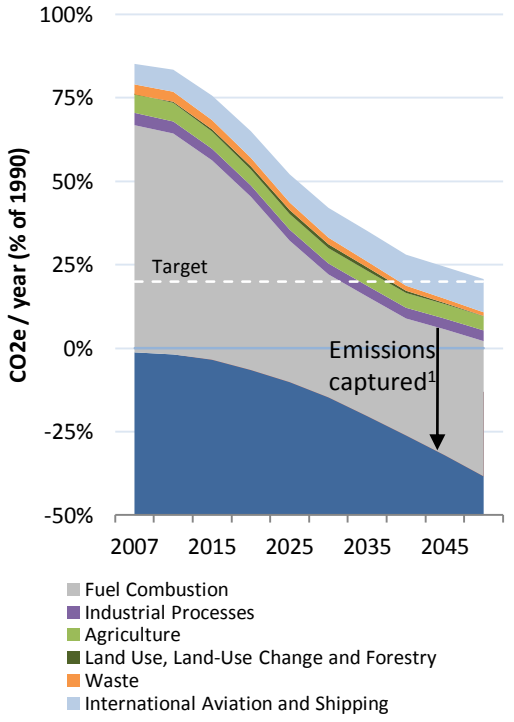
Demand by sector



Electricity generation



Emissions



This pathway requires £200B investment and £110B in electricity alone

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What we can learn from the pathways: there are significant implied challenges for the UK electricity system

Energy demand needs to reduce radically from business as usual

Alongside power, we need significant transformations in heat/ transport

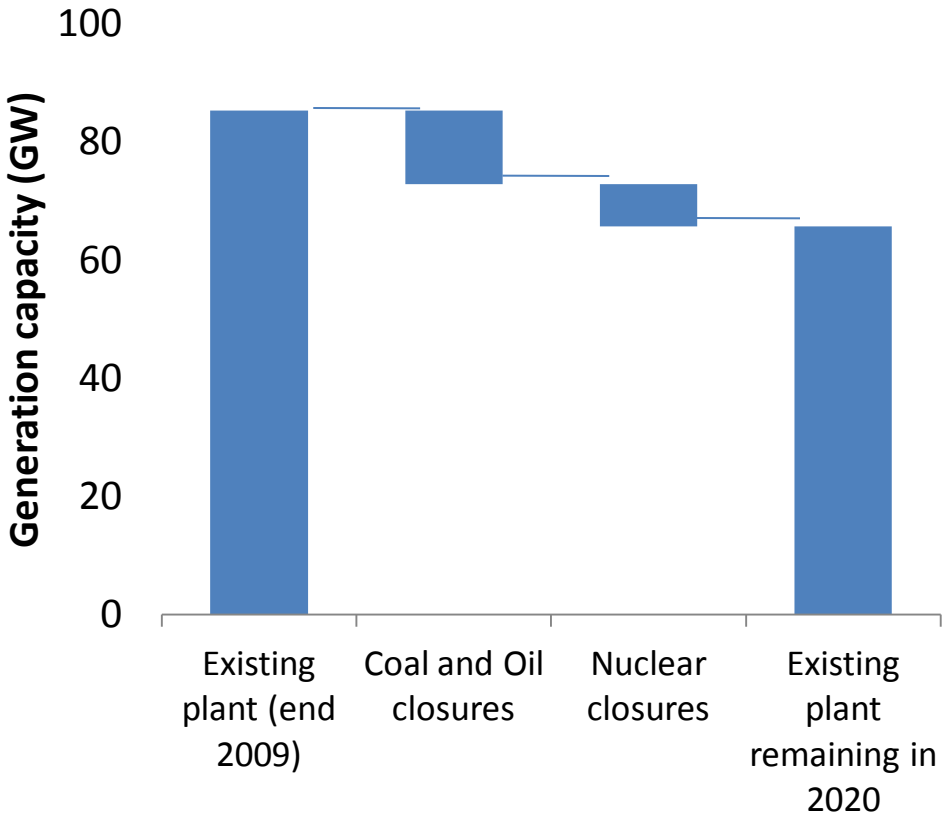
Demand for electricity may increase over time – possibly double

The power sector needs to decarbonise early – by the 2030s

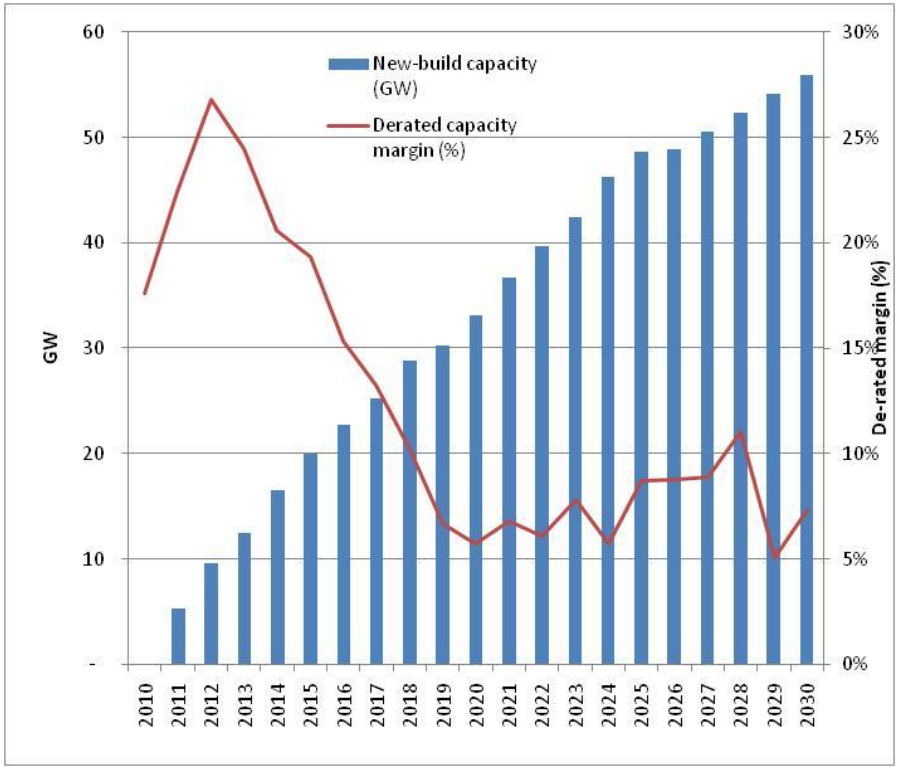
Significant changes required in UK power generation if we are to meet our carbon goals

Security of supply: we need to replace around a quarter of our plant by 2020

Around a quarter of our plant will close by 2020



Although we expect new plant to be built margins may be tight in the 2020s



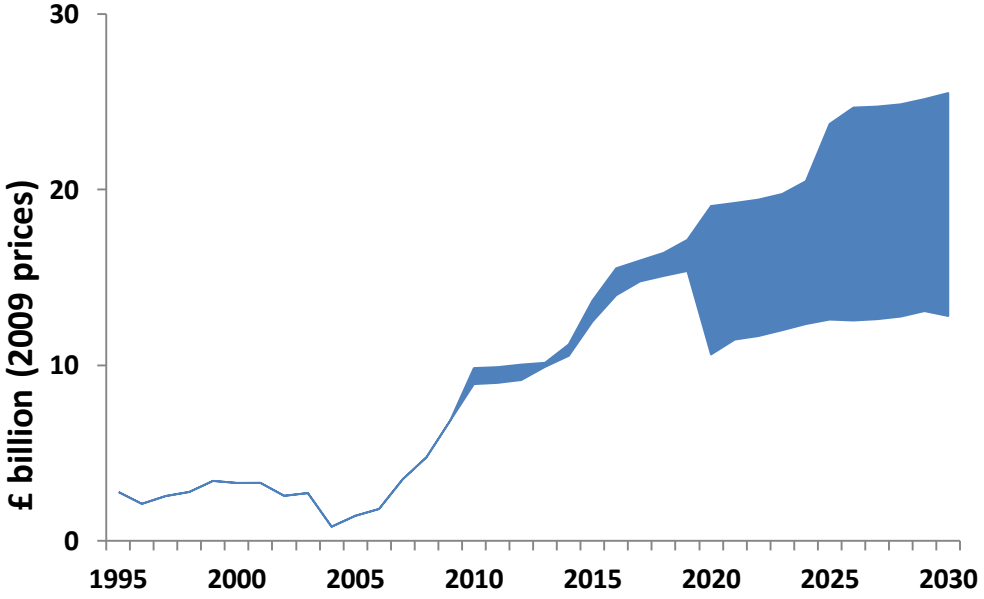
Redpoint analysis

Notes and sources: Existing capacity from DUKES 5.7, as at end 2009; excludes interconnectors. Closures refer to those due to LCPD opt-out and known nuclear end-of-life dates; capacities taken from National Grid SYS 2010.

This leaves an investment challenge: our task is to deliver this at least cost to consumers

Investment required in electricity sector by 2020

Annual capex in GB electricity sector – illustrative range of estimates



We have a huge investment challenge

- £200B for energy infrastructure
- £110B for electricity generation and transmission

Our task is to deliver the investment we need at the <u>lowest possible price</u> for consumers

The current arrangements in electricity will not deliver this

Weak carbon signals

"Bias to gas"

Security of supply

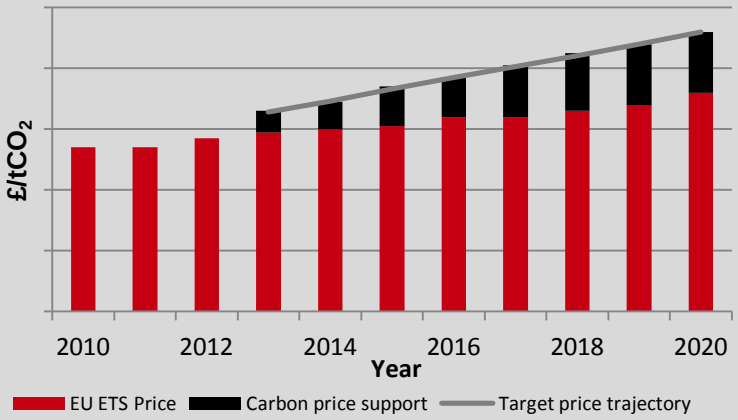
Scale of finance needed

<u>If we do nothing:</u>

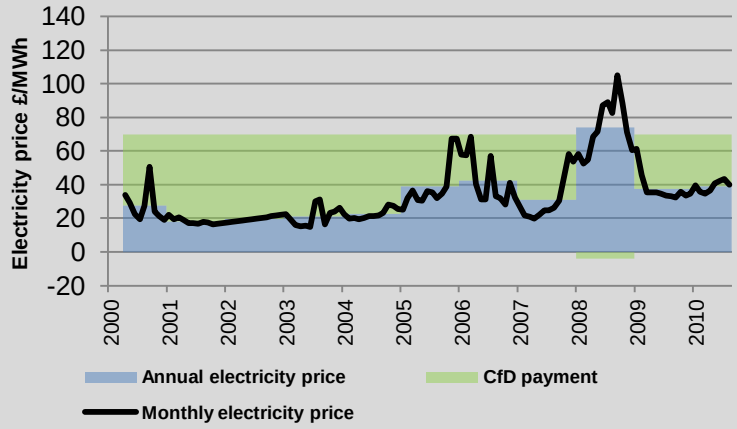
- **Less security of supply**
  - **Margins could hit 5% in lowest year and we may not be able to offset new intermittent generation**
- **Will not meet the scale of decarbonisation needed – we still have 200g CO_2/kWh in 2030**
- **Consumers pay more for electricity than they need to**

Our proposals – a four point plan for power market transition

Carbon price support



Long term contracts for low carbon generation



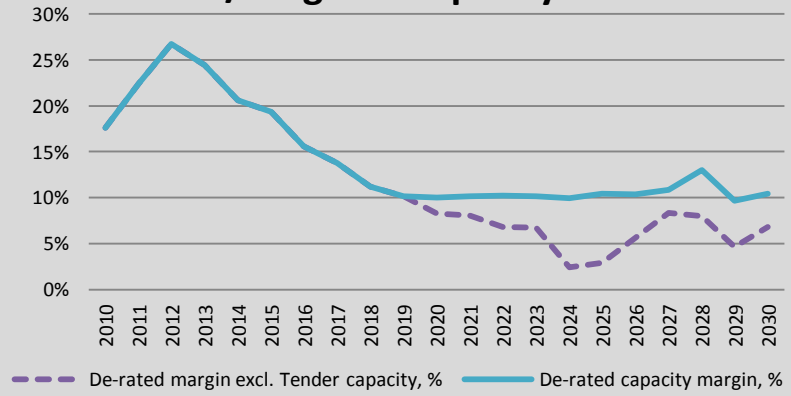
EMR package

Emissions performance standard:

Set at 450g/KWH

Grandfathering arrangements/ time limit

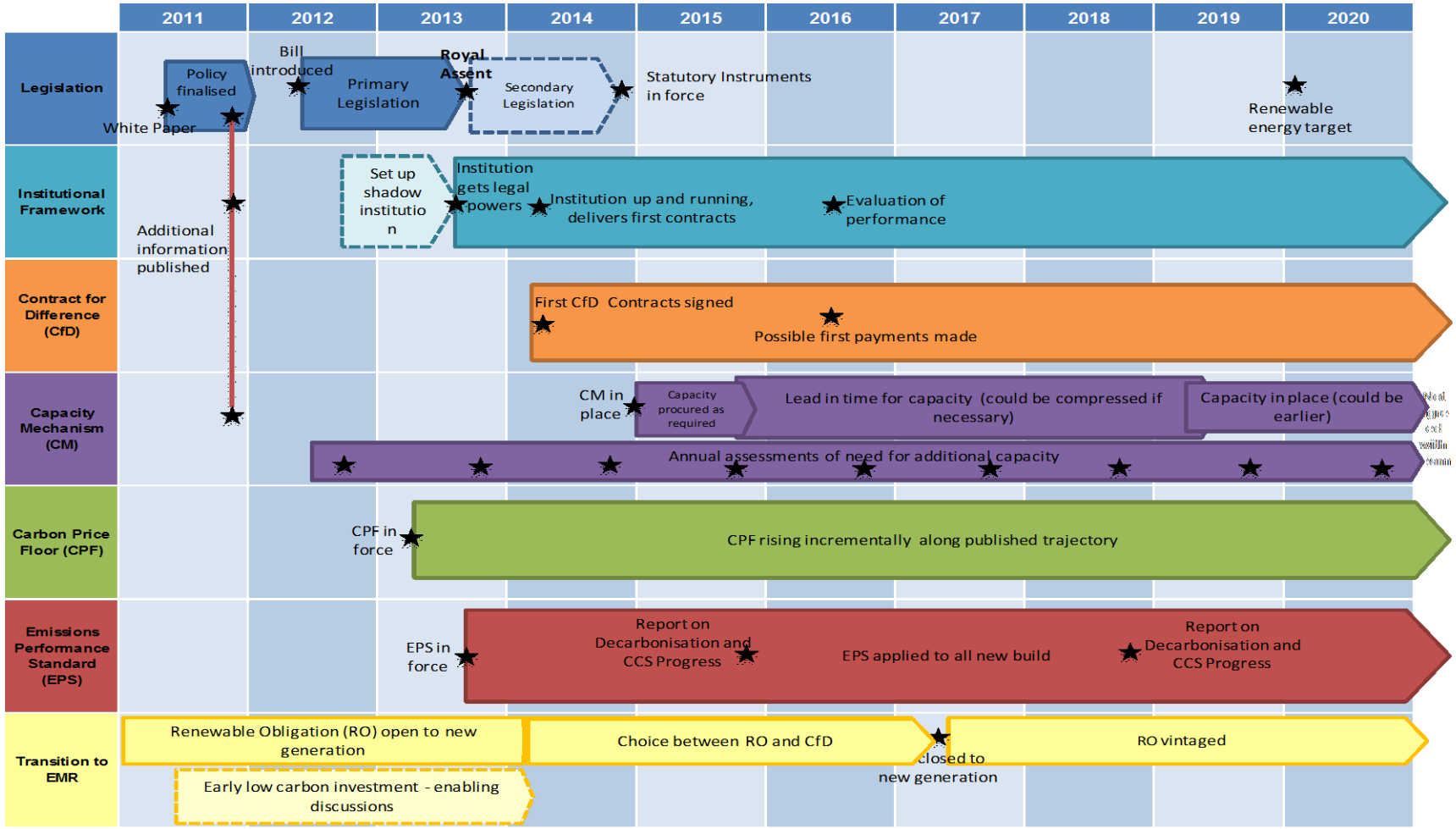
Market wide/ targeted capacity mechanism



Remaining: final policy decisions and moving to delivery

Final capacity mechanism model	Final design of the capacity mechanism
Demand side interventions	DSR in capacity mechanism, but do we need to do more on energy efficiency?
Institutions	Delivery arrangements to support these instruments
Transition	Long term transition planning/ bridging arrangements

The EMR programme is increasingly focusing on delivery – a long and challenging implementation



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Implications

Low carbon ambition	**Allows swift transition of the power sector – modeling shows a drop to 100g CO_2/kWh by 2030 and could go further.**
More secure supplies	**Capacity mechanism provides sufficient generation – to ensure supply meets demand at all times.**
Better deal for consumers	**Domestic consumers do pay more - £160 higher than today, but around £40 less than they would do with existing policy**