



Department
of Energy &
Climate Change

Capacity Market

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Head of CM Design

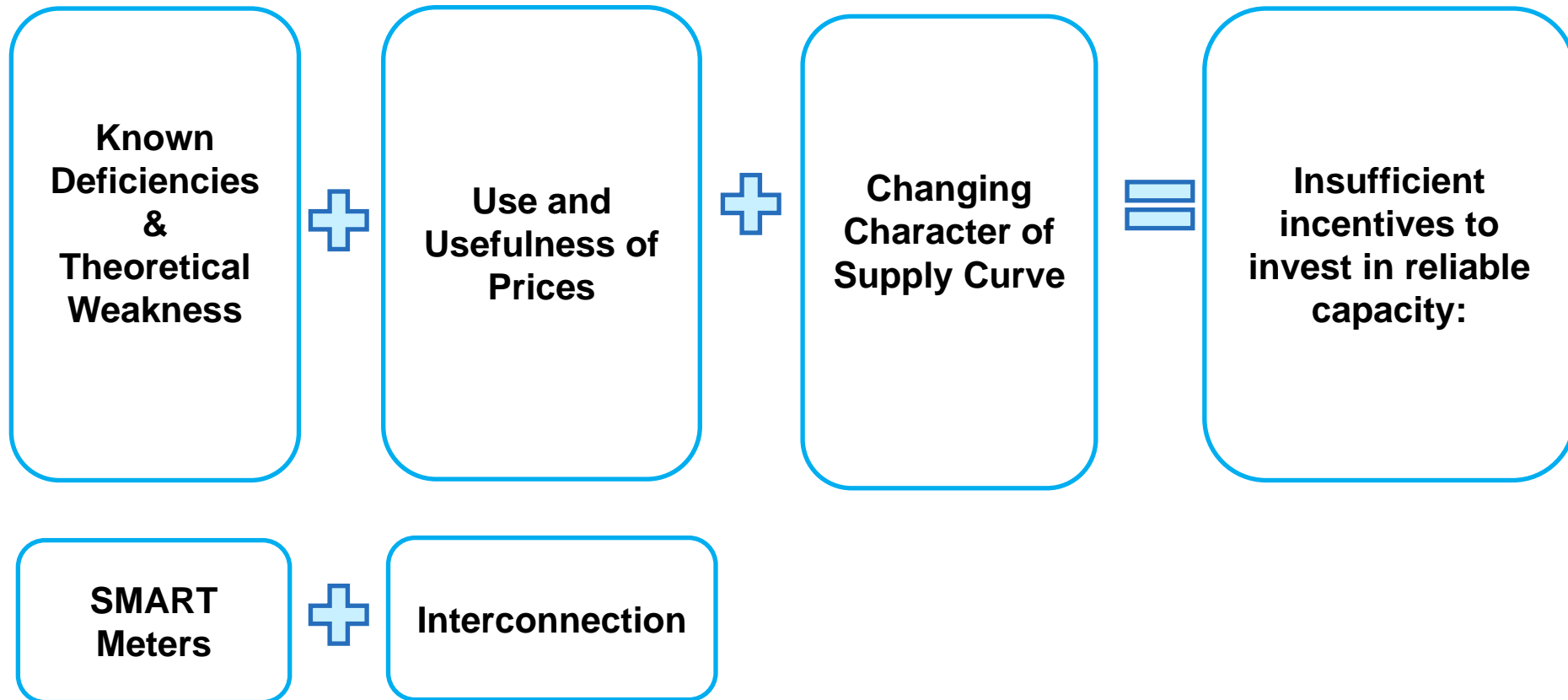
25 June 2014



Security-of-Supply Policy Intervention

The 2010 Diagnosis

- The GB energy-only market performed well but by 2010 there sufficient *prima facie* evidence to warrant intervention given that 1/5th capacity to close
- Reliability is a public good





Interconnection to GB



4GW

Existing Projects				Developer(s)
IFA	France	2 GW	1986	NGIL / RTE
Moyle	N. Ireland	500 MW	2002	Mutual Energy
BritNed	Netherlands	1 GW	2011	NGIL / TenneT
East-West	Ireland	500 MW	2012	EirGrid

+9?

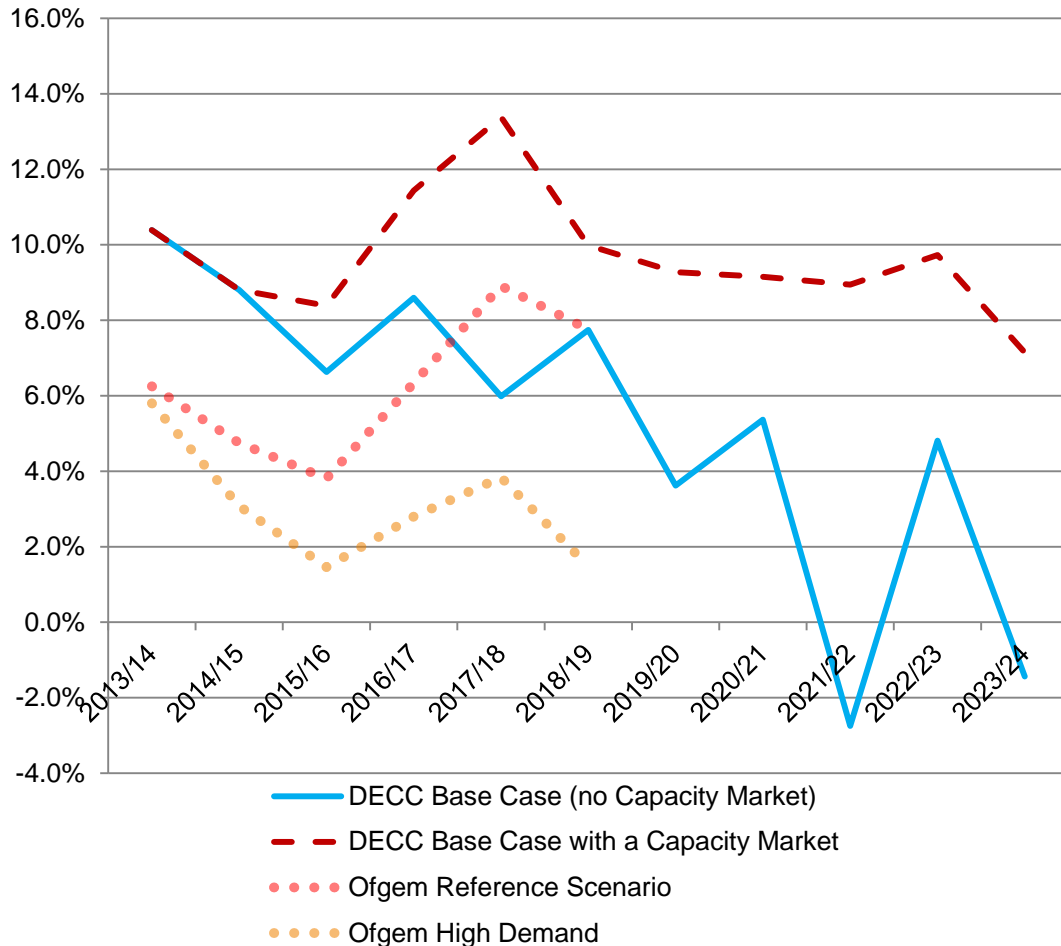
Pipeline			Date*	Developer(s)
NEMO	Belgium	1 GW	2018	NGIL / ELIA
Eleclink	France	1 GW	2016	JV: Eurotunnel & Star Capital
NSN	Norway	1.4 GW	2019	NGIL / Statnett
IFA2	France	1 GW	2019	NGIL / RTE
FABLink	France	1.4 GW	2020	JV: Alderney/ Transmission Inv't LLP] & RTE
NorthConnect	Norway	1.4 GW	2021	Consortium
IceLink	Iceland	1 GW	2020+	NGIL / Landsvirkjun
Viking	Denmark	1 GW	2020+	NGIL/Energinet.dk

*From National Grid's Interconnector Register (a record of connection agreement dates between developers and the System Operator).

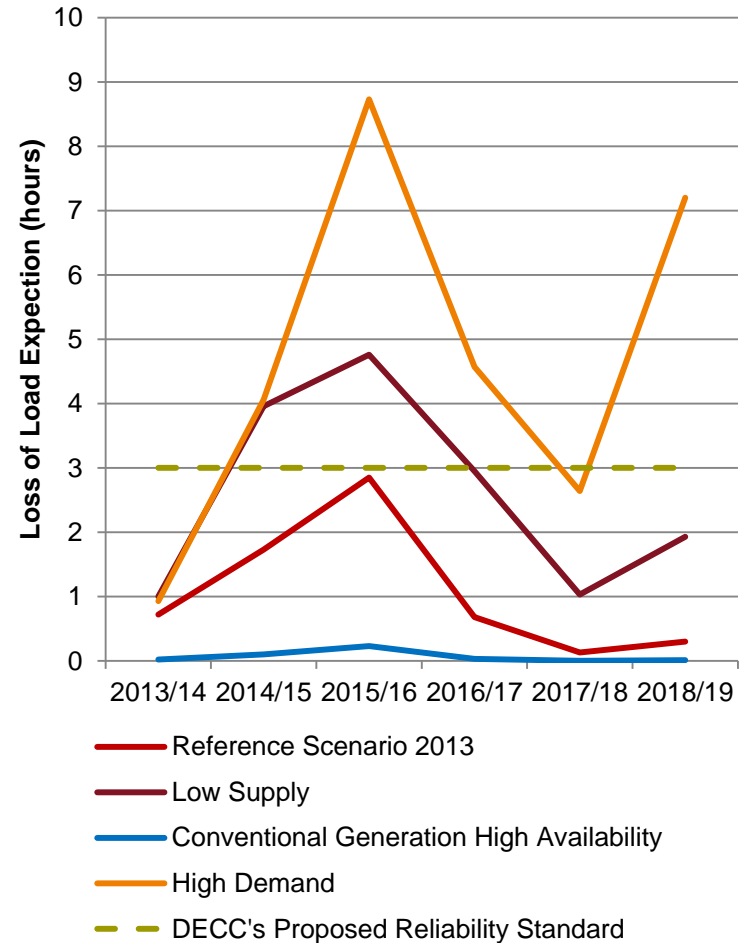


Security-of-Supply Problem

Ofgem and DECC estimates of de-rated capacity margins



Ofgem estimates of Loss of Load Expectation

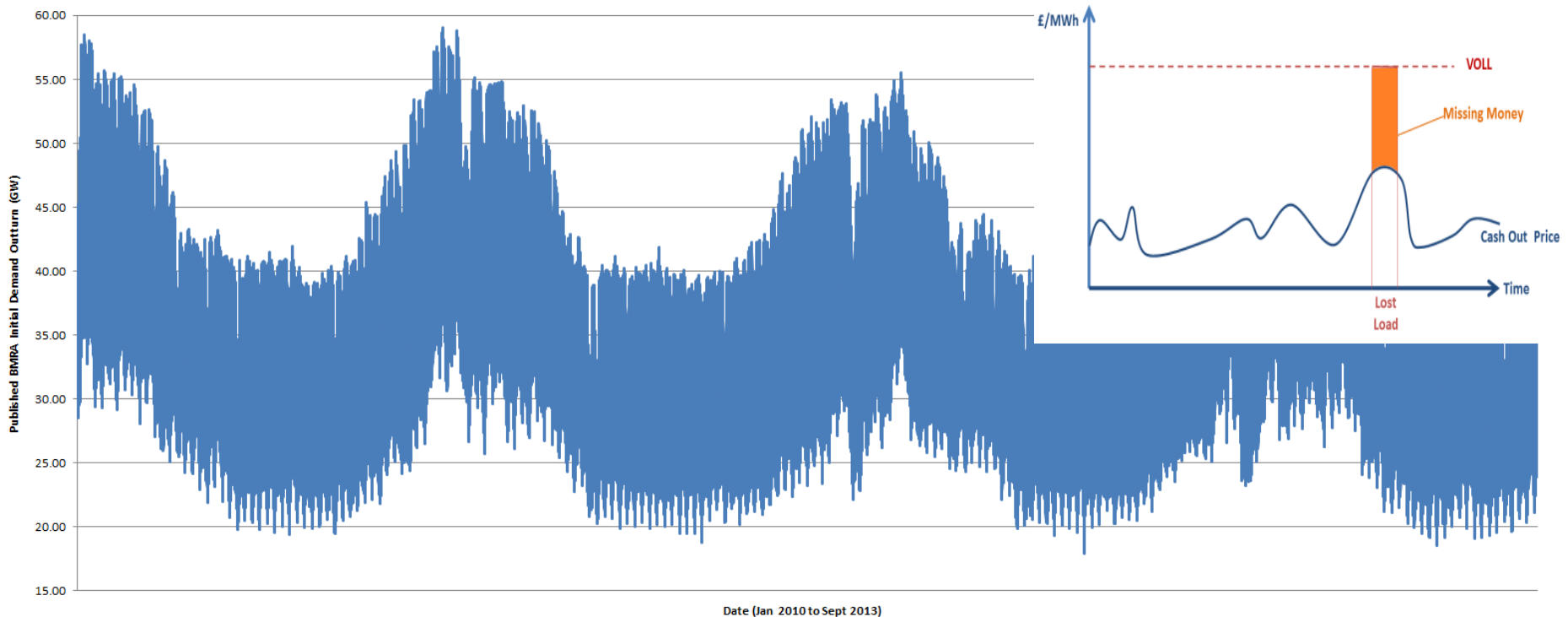




Peak Energy Rents – Missing Money

A perfect electricity market relies on occasional **rare and unpredictable** high prices to remunerate plant stock.

- Often co-incident with shortage periods (*generators profiteering on consumers distress and/or generators causing distress to profit*);
- Investor concern about risk of *ad-hoc* political and/or regulatory intervention;
- Capacity mechanisms are not new and have de-risked liberalized electricity markets



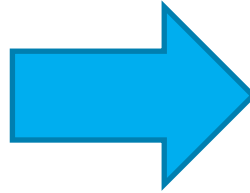


The Policy Approach

Any Bank plc		12-34-56
		Date: <i>Oct 2018</i>
Pay:	<i>Generator A</i>	Account paid
Sum of:	<i>£15 million pounds only</i>	£ <input type="text" value="£15,000,000"/>
		<i>Government</i>
I 000123 I 456 I 78910 111213		

1st Solve the Public Good

- Political intervention required
- Secretary-of-State set a long-term standard of 3 hours/year



2nd Solve “Missing Money” - Determine

- Quantity
- Who is deprived
- Distribute – in exactly the same way

- Incremental Reform – Adjunct Capacity Mechanism
 - Seamless fit and inter-operable with the existing eco-system
 - Electricity Market and Capacity Market a Systemic Whole
- Institutional Mode of Implementation
- Lengthy development with widespread public consultation
- Co-Ordinated with concurrent EU, legislative and regulatory proceedings
- Promote business-as-usual and avoid investment hiatus



Consultation

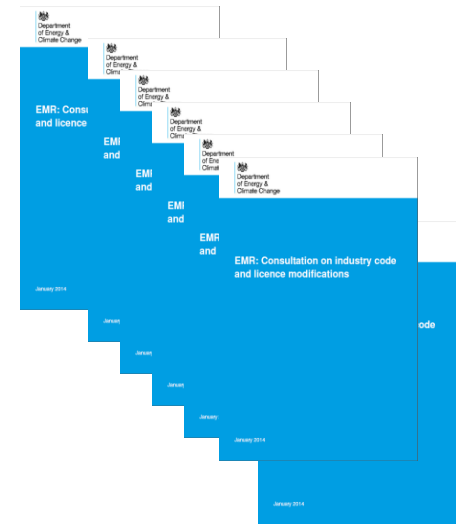
- Design “Blue-sky” (Dec 2010 to Dec 2011)
 - Problem Definition and market-wide intervention

- Legislation (May 2012 to Dec 2013)
 - Pre-Legislative Scrutiny
 - Energy Bill: powers to make Capacity Market Regulations and Rules
 - Delegated Power Memorandum
 - Compatible with Human Rights

- Detailed Design (May 2012 to June 2014)
 - Delivered Energy Model
 - Open the market in 2014
 - Investability and consultations with the lenders and insurers
 - Simplification

- Codification
 - Secondary Legislation
 - Consequentials on Licences and Codes
 - “Page Turning”

- Institutional Design – (Throughout)
 - Delivery Partners Selection
 - Capacity market a tax-and-spend (May 2013)
 - Synergies/Costs and Conflicts-of-Interest



Capacity Market Expert Group
100+ discussion papers



Implementation

Collaborative Development (May 2013+)

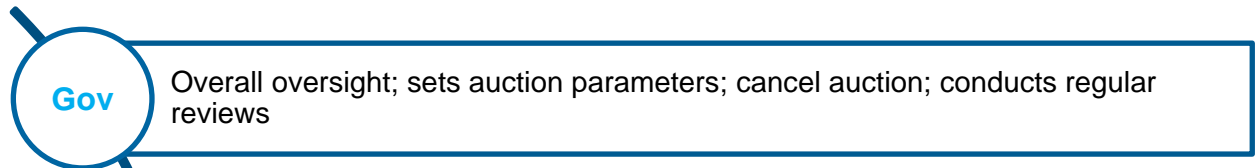
- Units-of-Work, Process Architecture and Role Activity Diagrams
- Interface Definitions and Business Readiness
- Industry Steering Group succeeded by the Senior Stakeholder Group
- 13 Workshops on CM Business Processes
- Issues Log, Operating Model, Implementation Plan – Baselined (Dec 2013)
- Industry Resolution Groups (esp, CMU definition)
- Industry Coordination (2014)
- Upcoming Elexon Meetings

Institutional Framework

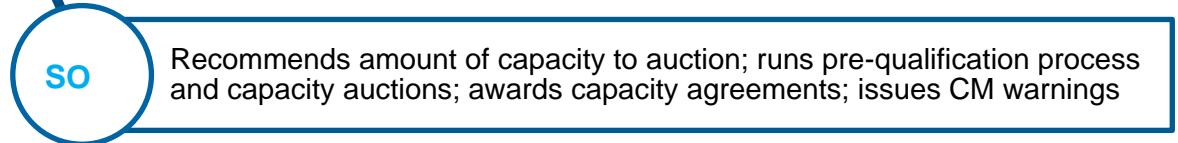
Guiding Principles

- Fit with Pre-Existing Roles & Norms
- Programme Evolution - Investor Certainty/Regulatory Risk

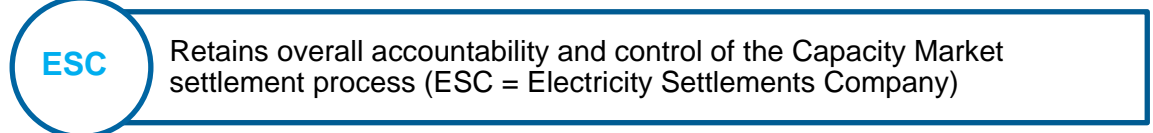
- Legal Constraints



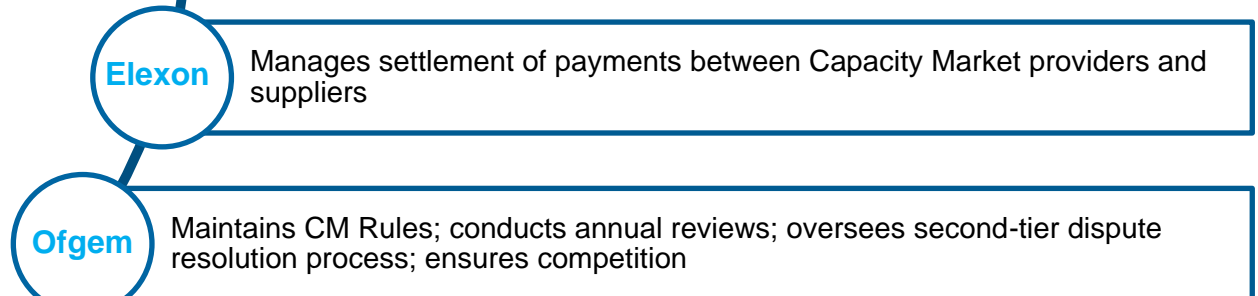
- Governance



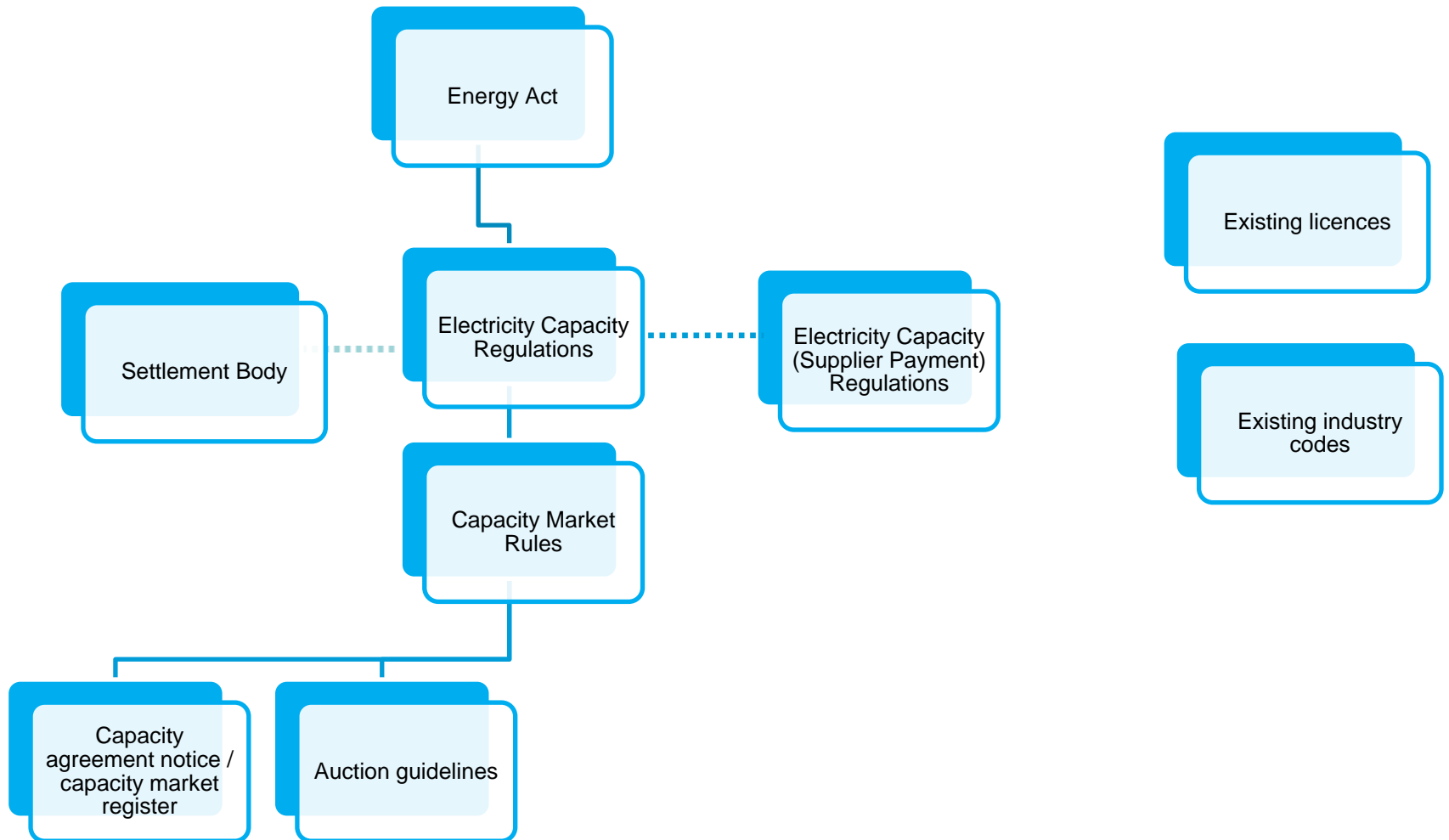
- Practical Issues



- EMR MoU in place with Ofgem



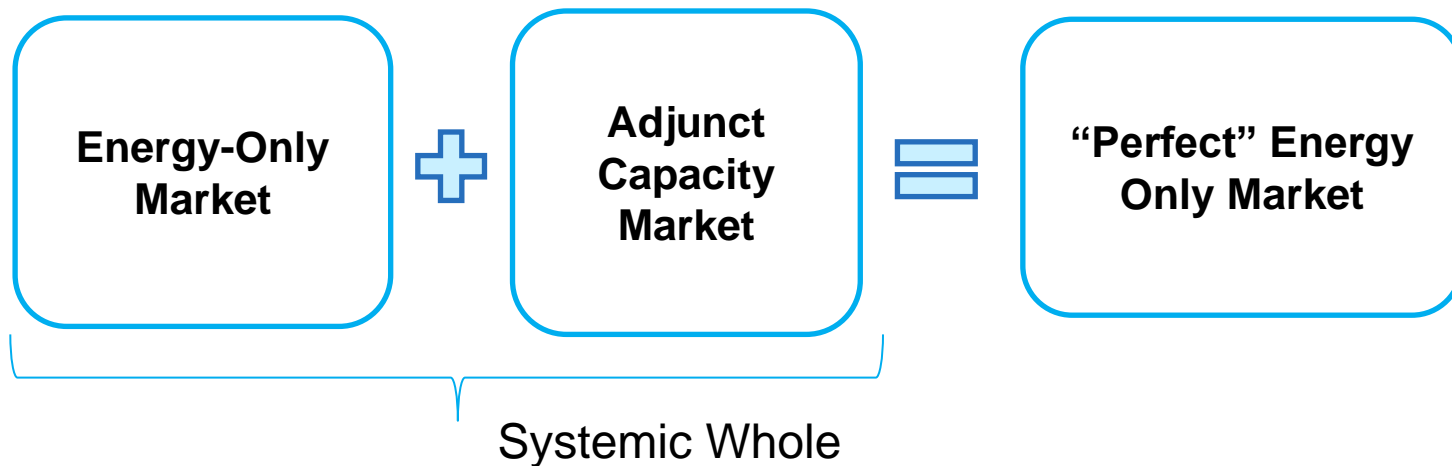
Capacity Market Legal Framework





Market Design

Guiding Principles



Affirming the Consequent: Given a proposed design component “P”

- If “P” is included in the CM then incentives (“I”) are compatible
- Test “I”
- Include or reject “P”

NB - Investability

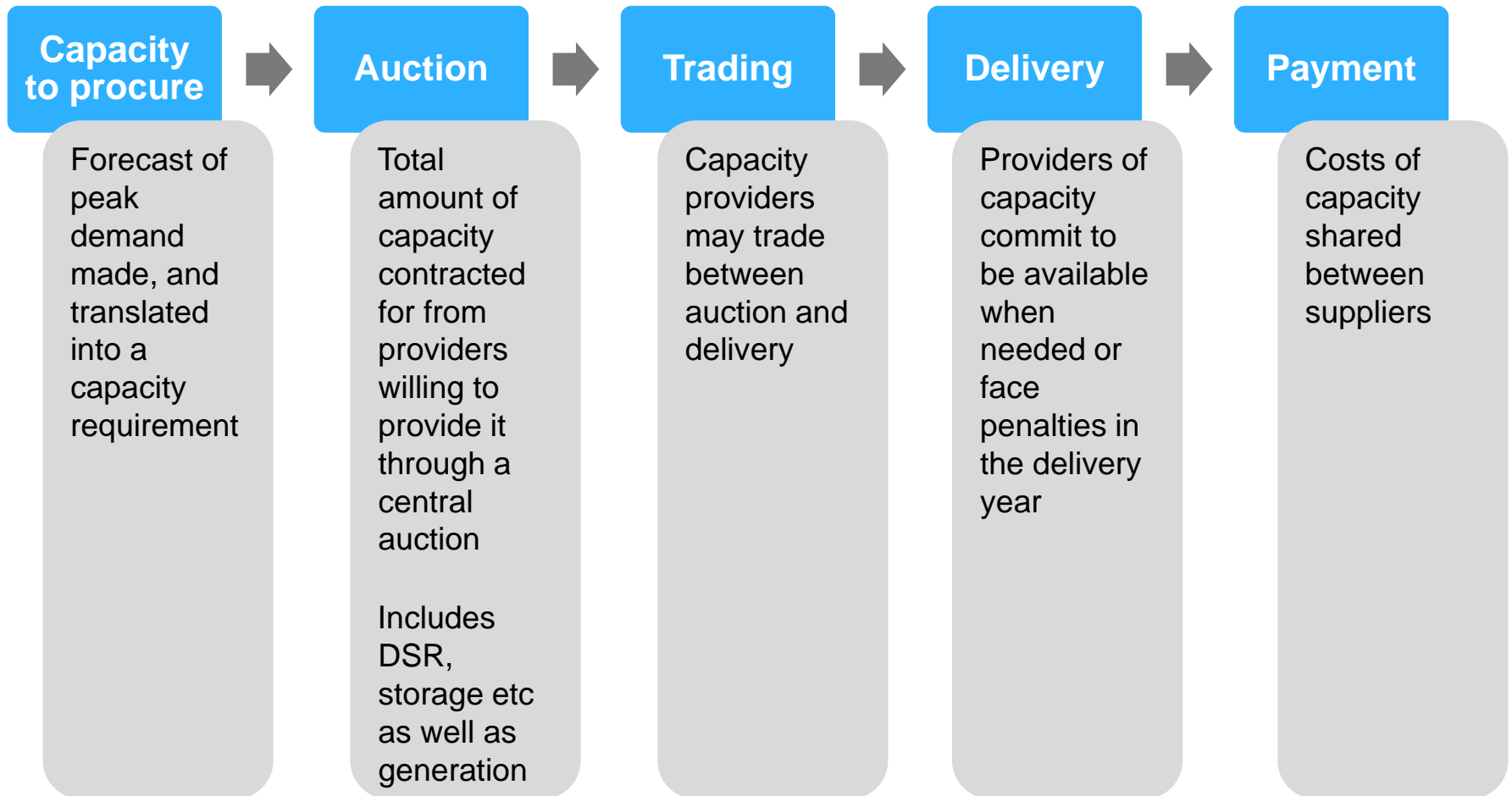


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Final Market Design



Capacity Market – high-level design





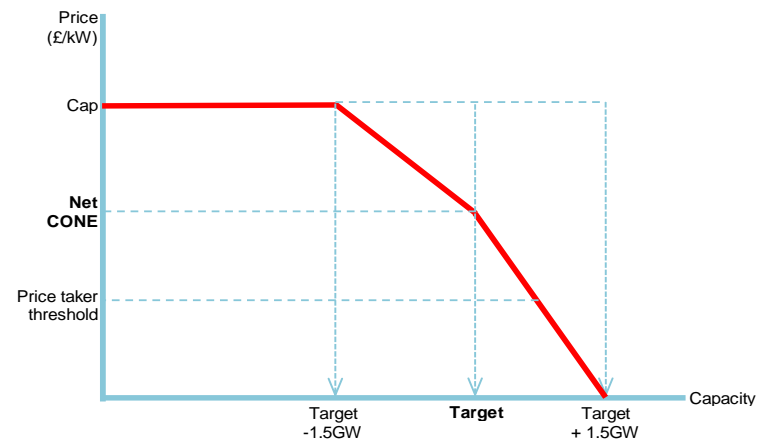
Amount to Auction

Confirmed

- **The CM will open 2014 (subject to Parliament and State Aid)**
- **Reliability Standard & CONE** – 3 hours loss of load expectation per year; 47 £/kW-year
- **Demand Curve Methodology**

Update

- **Electricity Capacity Report** – to include an estimate of embedded generation
- **Price Cap** - £75/kW-year (Cleared HMG)



- NG Future Energy Scenarios complete Electricity Capacity Report received by SofS
- PTE scrutinise NG analysis and render independent advice to the SofS
- SofS determines the (preliminary) Demand Curve & Auction Parameters
- NG publishes Auction Guidelines & Pre-Qualification Begins
- SofS determines the final Demand Curve (taking account of pre-qualification)



Pre-Qualification Update

Confirmed

- **Market Power Mitigation #1* – Pricing Restrictions**
 - Existing resources default to Price Takers (exception unless memorandum lodged**)
 - New resources default to Price Makers
- **Market Power Mitigation #2*– Quantity Restrictions**
 - Resources De-Rated centrally
 - (exception for DSR to nominate less**)
- **Market Power Mitigation #3* – Withdrawal Declarations**
 - Permanent/Temporary/Operational
 - All statements discoverable
 - False Temporary Declaration – Termination Event
- **Capacity Agreement Categories**
 - Existing/New/Refurbishment
 - Financial Spend Thresholds
- **Metering Pathways – Four pathway options**
- **Permitted Persons – UK resident companies removed**

- **Nomenclature – Ethical Requirements now Prohibited Activities**
- **De-Rating Factors – Applied to Connection Energy Capacity (or Distribution equivalent) or average of 3 self-nominated Settlement Periods over the last 2-Years**
- **Price Maker Certificate Net-Go-Forward Costs Definition – “earnings” replaced by “risk adjusted...value of sales”**
- **May 2012 Definition of New CMU– Not commissioned by effective date of pre-qualification**
- **CMU Definition - Net Metering; Trading Unit; Boundary Point or sub 50 MW aggregate sites**
- **Eligibility – Excluded facilities which are:**
 - encumbered by long-term STOR contracts (unless accompanied by offer to terminate for 2018 only)
 - receiving support (FiT, RHI, ROO, NER300, CCS) and low carbon now self-certified
- **Collateral Instruments– Cash and LOCs (which can be rolling)**
- **“Head Count at T-10 days” – Last Chance for Opt-Out of Non Mandatory CMUs & DSR to nominate de-rating**
- **Conditional Pre-Qualification**
 - Perfect prudential security (DSR Bid Bond and TF1)
 - Final planning consent (2018 only)
- **Cancellation of Auction – SofS discretion**

*There is a general market manipulation proscription

**Means status of pre-qualification may change



Auction

Confirmed

- **Reverse Auction**
 - Prospective CMUs make price offer to undertake the Capacity Obligation
- **Pay-As-Clear** - All successful CMUs paid the clearing price (£/KW-year)
- **Price Discovery by Descending Clock and Combinatorial Logic**
 - 'clock' is progressive price decrements
- **Refurbishment CMU and Pre-Refurbishment CMU**
 - On exit Refurbishment CMU re-entered as Pre-Refurbishment CMU
- **Conditions Subsequent: Termination Events**
 - Execution of Distribution Connection Agreement (T-1.5) or termination fee applies
 - Satisfactory attainment of milestones (T-2.5/T+1) or termination fees apply (supported by Independent Technical Expert)
 - Prove Un-Proven DSR (test or data) (T-1 month) – or forfeiture of bid bond
 - Satisfactory metering configuration (T-1.5/T-2 months)
- **Conditions Subsequent – Other**
 - Satisfactory completion of refurbishment works (T0) or Replaced by Pre-Refurbishment CMU

Update

- **Auction Monitor**
 - Role restricted to compliance (i.e. not bidder behaviour) and no right to request information
 - Renders a report to the SofS within 5 days
 - SofS has 5 days to annul the provisional provisional results
- **Bidding teams ring-fence requirement**
 - Removed
- **Price Duration Curves** – Powers to be taken to express preference for tenors
- **Clearing Algorithm** – Maximizing consumer welfare
- **Minimum Completion Milestone**
 - **T-0 payments start if >90% and adjusted anytime but frozen at T+1.5**
 - **T+1 (latest) <50% triggers cure**
 - **T+1 (latest) >50% payments start but frozen at T+1.5**
- **Additional Conditions Subsequent (for 2014 Only)**
 - Transmission Entry Capacity (T-1.5) or is an event of termination and termination fee applies



Performance

Confirmed – Capacity Obligation Attributes

- **Nature - “Delivered Energy Model”**
 - Delivery energy/reduce demand commensurate with Dynamic (i.e. load following) Capacity Obligation let at Auction
- **Trigger – Stress Occurring + Warning Given**
 - Stress Event: automatic or manual
 - Warning: explicit or implicit (margins)
- **Adjusted by**
 - Load Following *ex-post* notified
 - Balancing Services position
- **Excepted By**
 - Invocation of BSC Contingency (Section G)
 - Deficiency of the Transmission or Distribution System
 - Fuel Security Code directions

Update

- **Progressive Performance Standard**
 - No self-nomination of de-rating factor (except DSR)
 - Base Payment for Capacity Obligation and Bonus/Penalty for Over/Under Delivery
 - BM/non-BM distinction removed
- **Penalty Rate** – Such that monthly cap reached in 4 hours (i.e. clearing price*200%/(12 months per year)/(4 hours)) or c. £3,000/MWh for £75/kW-year price cap
- **Over-delivery Rate** – Lower of penalty rate or quotient of annual penalty revenue (£) and total over-delivery volume (MWh)
- **Gas Deficit Emergency & Maintenance Windows** No allowance
- **Limitation on Liability**
 - No liability until warning in effect
 - Portfolio cap removed; Monthly (Soft) 200%/Annual (Hard 100%) Revenue Cap (Cleared HMG)
- **Demonstration/Testing Regime**
 - If a CMU fails to demonstrate performance on 3 occasions in “Winter” then payments suspended (1 month minimum)
 - Testing requirement: 3 demonstrations (increased to 6 if CMU failed in 2 stress events in separate months)
 - DSR must nominate periods in advance



Secondary Trading

Confirmed

- Dynamic **Physical** Capacity Obligations originated at auction
 - ‘stapled’ to homogenous physical resources;
 - optimally configured for peak conditions.
- Self re-configuration of the set of Obligations provided no erosion of surety of physical delivery quantity/quality
 - Capacity Providers (who are also participants in the energy market) arrange affairs and preserve the commitment and dispatch order.
 - Risk management device for Capacity Provider
- The rules/processes to enable this have been variously referred to as ‘**secondary trading**’ or ‘**secondary market**’
- Government’s has a vital interest to enable by creating the necessary conditions, removing barriers and fostering liquidity.
 - Private Financial Trading anticipated
 - No Government led development of an organised market

Update

- **Nomenclature** – “Hybrid” and “Physical” trading now “Volume Re-Allocation” and “Obligation Trading”
- **Obligation Trading** – Transferee an “Empty Vessel”
 - Clip size 1 day
 - Testing requirement maybe amended
 - Under-delivery levied from highest to lowest penalty rate
 - Over-delivery paid at the weighted average.
- **Volume Re-Allocation** - ex-post nomination (11-19 days) with 3 rules
 1. Donor must have surplus
 2. Recipient must have shortfall
 3. Limited by quantum of recipient shortfall

Next Steps

- HRMC considering VAT and Stamp Duty Issues with Obligation Trading



Settlement

Confirmed

- **Supplier levy a form of taxation** – awaiting confirmation by Office of National Statistics
 - Compulsory and non-required
- **Payment to Capacity Providers** – Weighted by GB electricity demand over preceding 3 years
- **Delivery Year** – 1st October to 30th September
- **Non Voted Expenditure**- Regulations setting out the tax to be collected for every Delivery Year will be laid before Parliament

Next Steps

- Awaiting ONS formal classification
- HRMC on VAT

Update

- **Nomenclature**
 - Settlement Agent re-named Settlement Services Provider.
- **Settlement Body Incorporated** – T/A Electricity Settlements Company
- **Settlement Agent Removed** – Activities re-assigned to the Settlement Body
 - Contract for service to be put in place between SB and Service Provider
 - SB and CfD Counterparty Body to share services
- **Charges**
 - Supplier Charge
 - Settlement Costs Levy
- **Billing Determinants** – Energy consumed 4-7pm weekdays during “Winter” (Nov-Feb) i.e. aligned with TNUoS
- **Settlement Costs Levy** – To be collected on a fiscal year basis starting Sept 2014 (but will be invoiced in arrears Jan 2015)

Appeals

Confirmed

- **Tiered Disputes**
 - Tier 1 – Disputant and National Grid
 - Tier 2 – As above including the Authority
 - Tier 3 – As above at Court
- **Grounds of Dispute**
 - Termination
 - Prequalification
 - Entries in the CM Register
 - Entries on the CM Notice

Update

- **Nomenclature** – Appeals now “Dispute Resolution”
- **Clarifying** – the content of an application to the Authority
- **Process Requirements**
 - Ensuring that Tier 1 complete before Tier 2 can start and ditto for Tier 3
 - Tier 3 restricted to matters of law
- **Timelines** –non-legally binding timeline to be set out
Ofgem guidance

Next Steps

- Ofgem preparing guidance on Dispute Resolution



Scheme & Auction Parameters

Auction Parameters

- **Price Cap** – £75/kW-year (confirmed for T-4 for 2018)
- **NetCONE/Price Maker Threshold** - £49/kW & £25/kW
- **Total Target.T-1 Target/T-4 Target** - TBD
- **Base Year for Indexation** – For T-4 2018 bids to be made in 2012 money and indexed to Delivery Year
- **Decrements** - 4 rounds/day; 4 days - £5/kW-year
- **Surplus Report** – To Nearest 100 MW
- **Price Duration Curve** – Dis-applied for T-4 for 2018

Scheme Parameters

- **Demand Curve Methodology**
- **Thresholds per MW of De-Rated Capacity**
 - New Generating CMU - £250
 - Refurbishment CMU - £125
- **Milestones (New Generating CMU)**
 - Financial Commitment – Spend/Commitment Minimum at T-2.5
 - Substantial Completion – By Long-Stop Date (T+1)
- **Milestones (Refurbishment CMU)** – Works completed by T0
- **Termination Fees**
 - TF1 £5/kW
 - TF2 £25/kW
- **X of Y for DSR Baseline**
 - 11/14 SP over previous 6 weeks (non/working days)
 - “Day-Of” Adjustment
- **Maximum Capacity Agreement Lengths**
 - Existing: 1 Year
 - Refurbishment: 3 Years
 - New: 15 Years ((Cleared HMG))



Governance & Change Control

Confirmed

- **Status of Capacity Agreements**
 - Not private law contract
 - Statutory rights and obligation conferred by Regulations & Rules
 - Regulations provide for run-off
- **Capacity Market Register**
 - Price (£/kW-year) and Term (Years)
 - Identification Delivery Years
 - Capacity Obligation (MWh)
 - Capacity Price (£/kW-year)
- **Consultation on Rule Changes**

Update

- **Objectives for Rules** -Additional to Ofgem's principal objective ("to protect interests of consumers ...by promoting competition..") the Rules must
 - Promote investment in capacity to ensure security-of-supply
 - Facilitate efficient operation of the CM
 - Ensure the compatibility of CM Rules with the EMR legislation
- **Grandfathering provisions for Key Terms**
 - Milestone Dates (dd/mm/yr) & Termination Fees (£/kW)
 - Monthly (£) & annual (£) revenue caps
 - In addition to key terms already in CM Register

Next Steps

- Ofgem preparing guidance on Rule Changes



Breach and Events of Default

Confirmed

- **Termination Events/Default**
 - Insolvency
 - General Eligibility Criteria
 - Certain Conditions Subsequent:
 - Generating when temporarily opted out
 - Prohibited Activities
 - Failing to maintain TEC (where TF2 applies)
- **Termination for convenience**
 - Conversion to Biomass
- **“Firebreak” – Termination effective after notice of 60 working days**
 - Termination effective unless withdrawn in 60 working days
 - SofS has discretion to direct withdrawal of termination notice

Update

- **SofS enhanced discretion**
 - Extend firebreak (once) by 60 working days
- **Right of representation to SofS**
 - Seek withdrawal of a termination notice
 - Seek extension (exception generating when opted out)
 - Within 20 working days with reasons and cure plan
- **Special Provisions for Minimum Completion at Long-Stop**
 - Default at T+1 triggers 120 working day cure period
 - Milestone met or termination notice issued



DSR and Transitional Arrangements

Capacity Market

1. Initial guarantee to procure 50% of the set aside from T-4 in T-1
2. 3 metering options to be legislated for shortly: settlement meter (HHDA), balancing services metering and bespoke metering
3. Metering assessments and metering checks ensure robust data

Transitional Arrangements

The same in both

1. Annual cycle: pre-qualification, auction, delivery year
2. T-1 auction demand curve
3. Prequalification, inc. 2MW de minimus and 50MW cap, bid bonds for unproven DSR
4. Auction format, one auction
5. Participation in the balancing services
6. New and existing resources permitted
7. Baseline and Penalty
8. Testing regime

Different for TA

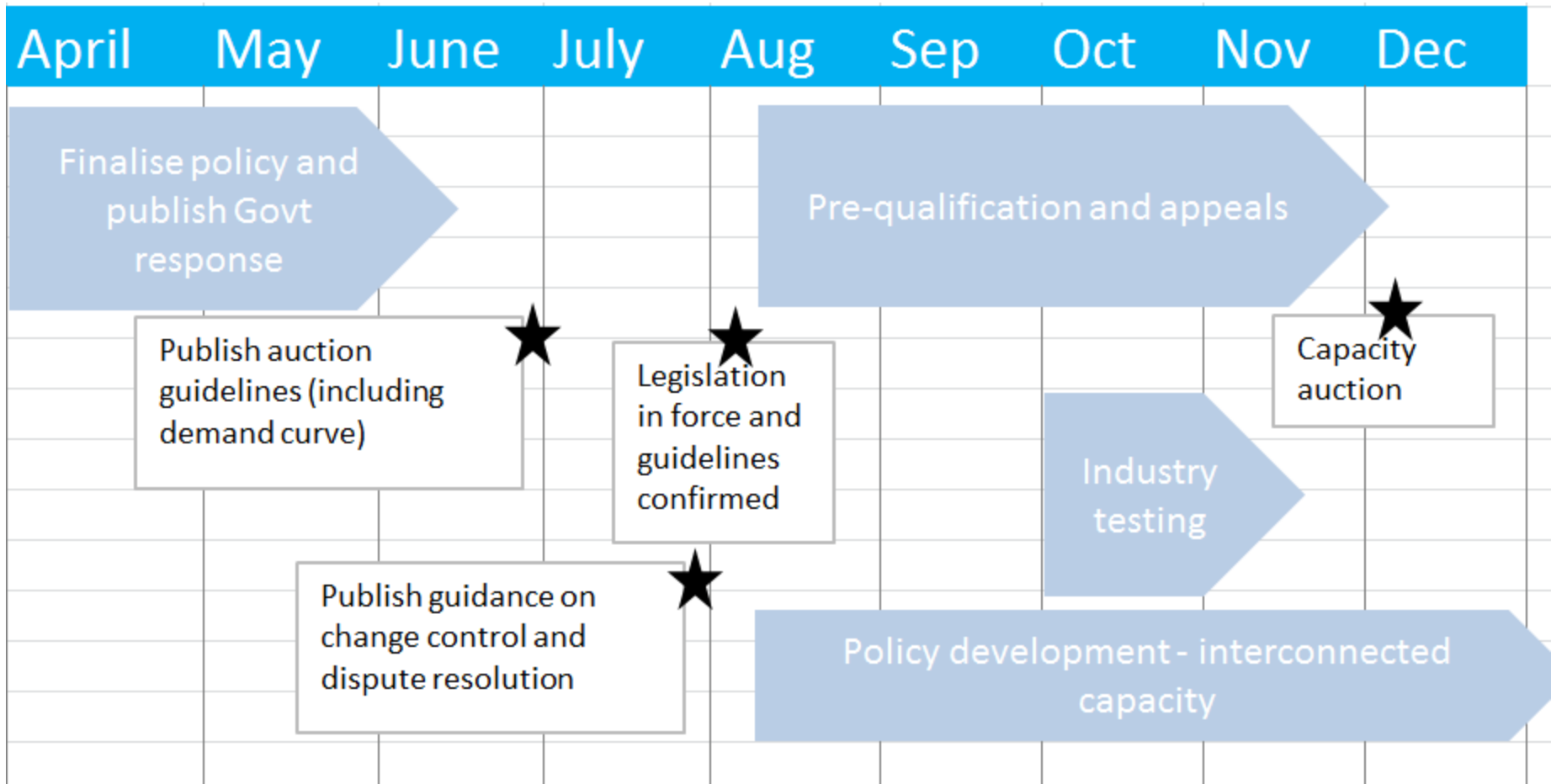
1. Starting in 2015 for delivery in 2016
2. Target volume not set to meet system demand
3. Only non-CMRS and CDR CMUs, capped at 50MW for non-CMRS CMUs
4. Two products – load following and time banded, providers nominate after the auction
5. 1 year agreements for all resources
6. Bid Bond set at 10% of main CM (£5,000 reduced to £500)

Interactions

- Units can move from TA to CM, but not vice versa
- Units can participate in DSR and TA, but not at the same time (if relevant)



Next Steps





Timeline

Key dates for first capacity auction:

- **30 June** - National Grid publish informal auction guidelines
- **1 August** – Legislation and code/licence changes in force
- **1 August** – National Grid publish formal auction guidelines
- **4 August** – pre-qualification window opens (runs to 15 August)
- **9 December** – auction begins

Further policy development:

Supplier Payment Regulations to be laid in Parliament in summer 2014.

Consultation planned in Autumn on amendments to the Regulations for:

- DSR metering
- Interconnection
- Additional provisions on payments



- **Rules and Regulation Planned Amendments – March 2015**
 - Metering Pathways
 - Interconnection and RoW resource participation (Frontier Economics appointed)
- **Price Duration Curves**
- **Review Policy**
 - Ofgem Annual operational review
 - DECC Annual Refresh to the Delivery Plan (5-Year Major Updates)
 - DECC 5-Year existential review & Market Failures (building on separate Ofgem review)
- **Secondary Market Functioning**
 - Ofgem Retail Market Review
 - PPA liquidity
- **EDR Pilots (2015 & 2016) and Participation in CM (c. 2017 or 2018...)**
- **Stage 1 DSR Transition Arrangements**
 - For Delivery Year 2016/2017 & 2017/18



Longer Term

Strategic

- Decarbonisation
- Evolving /Industry and Business Models
- Route-to-Market
- De-politicisation
- Institutional Frameworks

Routine

- **Capacity Market Warning**
- **Delivery Year** – Fiscal Year vs Capacity Year
- **Appeals**
- **Penalty and Testing Regime** Nomenclature & Ofgem Electricity Balancing SCR

Eligibility

- **Demand-Side Participation** - SMART Meters and SMART Networks
- **CfD Allocation to CfD Auctions**

Competition

- Competition Referral
- Auction Monitor
- Market Power Manipulation – REMIT
- Compliance Officer/Plans
- EMIR/MiFID2

Structural

- **Nature of Legal Relations** - Statutory or contractual scheme
- **Tax and Spend or Regulation**
- **Two-Sided Auction**
- **CMSB** - Contract Management Capability and Discretion
- **Construction Monitoring** – Client Engineer Approach

EU Issues

- Market Splitting –/Locational issues
- Internal Energy Market
- Capacity Remuneration Mechanism Harmonisation
- Network Codes



Acknowledgements

- Capacity Market Expert Group
- Delivery Partners & Ofgem
- Linklaters, CMS & Slaughter & May
- DWF Fishburns & Rothschild
- KPMG & Charles Rivers Associates
- Venice Consulting & PWC
- Frontier Economics



Defining Generating CMUs

