ofgem Making a positive difference for energy consumers

Cost Assessment Working Group

Meeting 10

Ofgem
July 2019

Agenda

1. Introduction (11:00 - 11:15)
2. CAWG terms of reference (11:15 – 11:30)
3. Cost assessment consultation discussion (11:30 – 13:15)
4. Lunch (13:15 – 13:45)
5. Business plan data templates (13:45 – 14:45)
6. CAWG forward plan (14:45– 15:15)
7. Summary (15:15– 15:30)

CAWG Terms of Reference

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CAWG Terms of Reference

We have updated the GD CAWG terms of reference. The main updates cover the following topics:

1. Clarity on how long the CAWGs will run for
   - We will continue to hold CAWGs this year where the group feels it is necessary (potential future session dates and topics to be discussed later in this meeting)
2. Confidentiality
   - We will not discuss the content of the draft business plan submissions in the working groups
   - If we bring any modelling work or analysis to these groups, we won't use forecast data from draft plans, we will only use historical data we all have access to
   - We will not give any judgement or company specific feedback on the content of the draft business plans

RIIO-2 tools for cost assessment consultation

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Overview

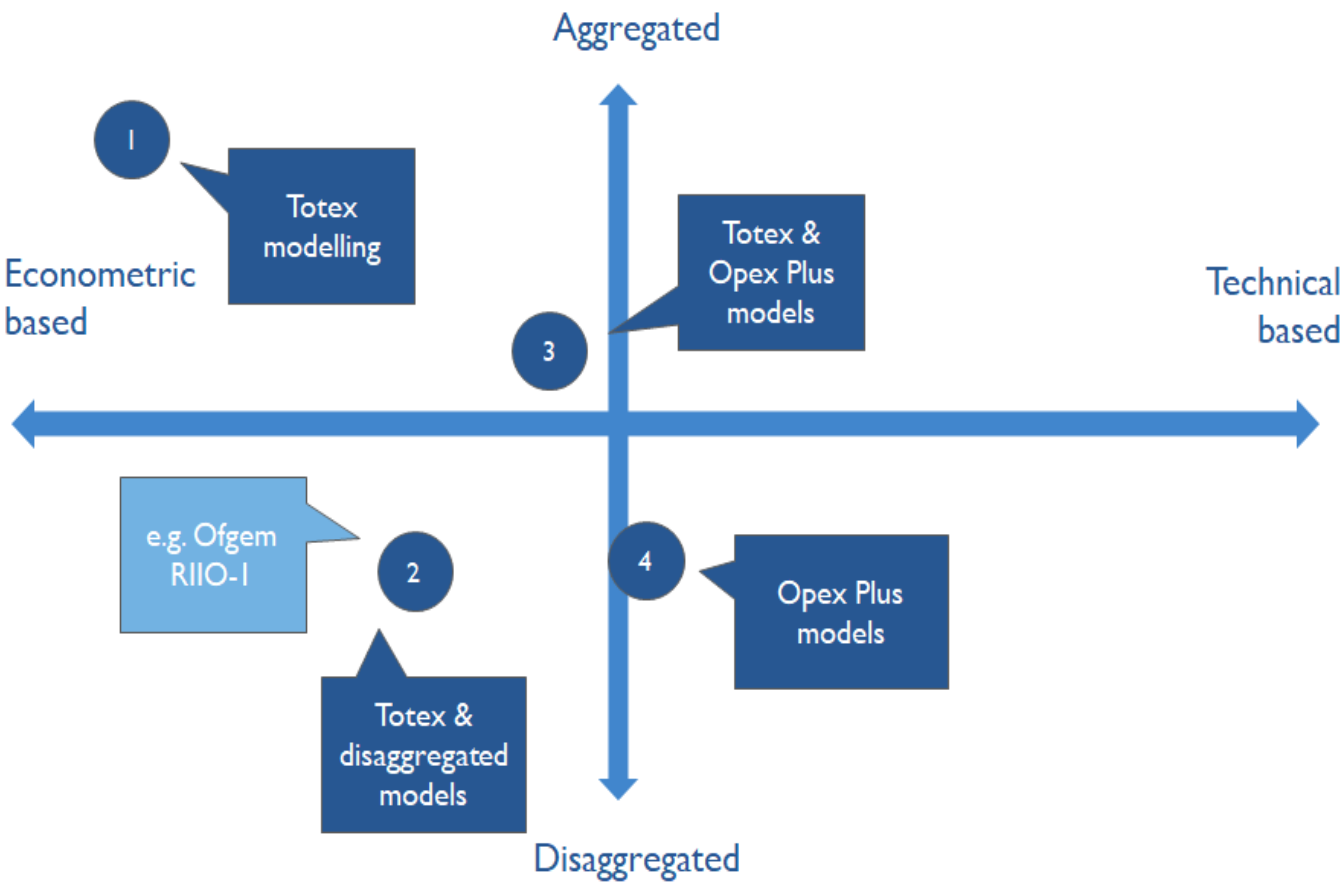
- Cost pooling
- Workload drivers
- Regional factors
- Consultation questions
- Timeline and activities

Cost pooling

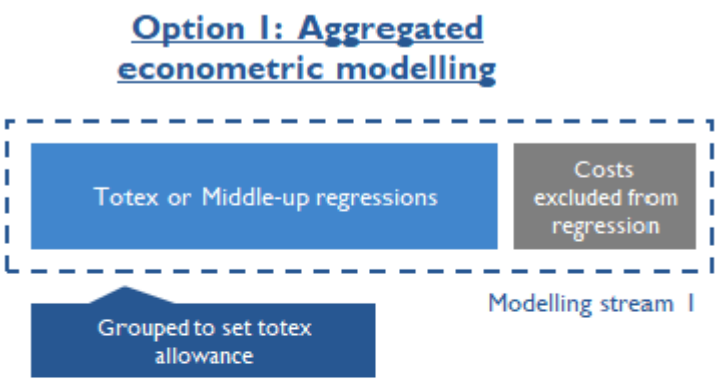
- CEPA principles for selecting a cost pool
  - Complementary
  - Cost trade-offs
  - Cost boundary complexity
  - Risk of inaccurate/biased models

- How to identify complementary types of expenditure?
  - Test for year-on-year volatility in expenditure that is unrelated with changes in business scale drivers
  - Test the expected consistency of workload drivers between different types of expenditure before costs are grouped together for benchmarking

Cost pooling options

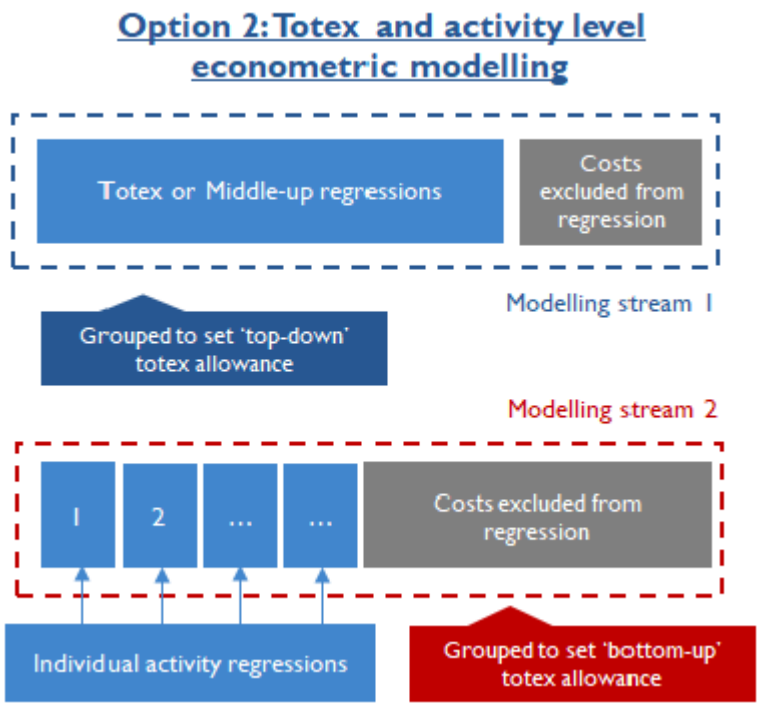


Cost pooling options (1)



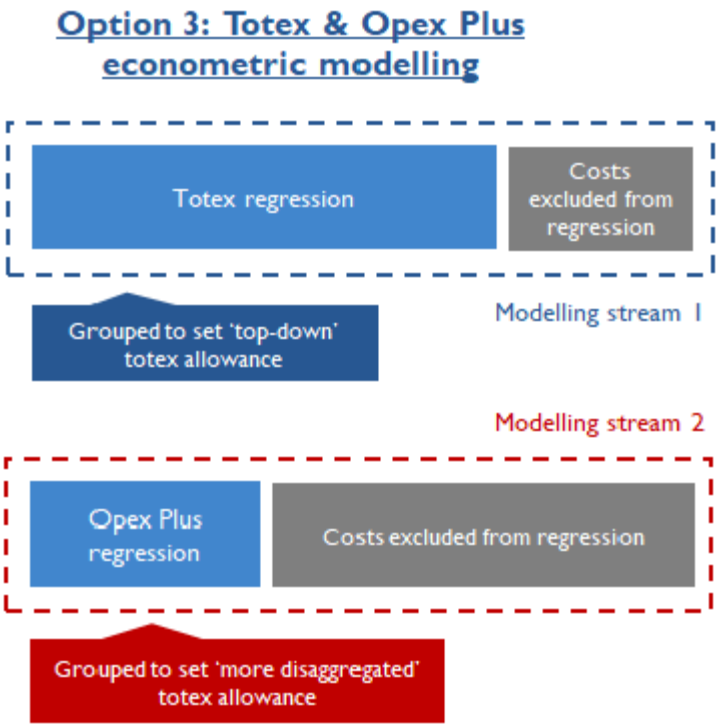
- Highest level of aggregation (top-down)
- Strong incentive properties if based on exogenous cost drivers
- Cost drivers may not be fully captured, so model adjustments may be required

Cost pooling options (2)



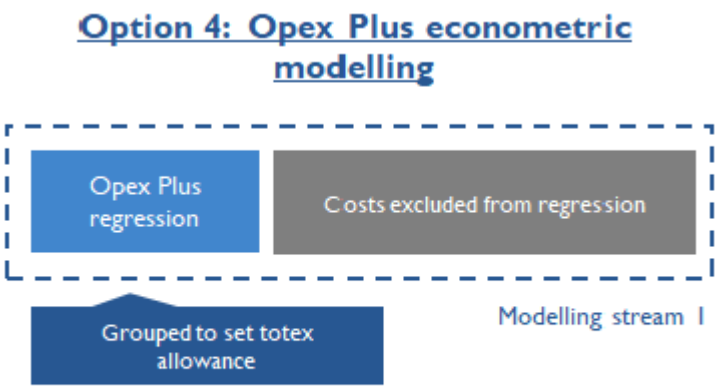
- In line with GD1 approach
- Disaggregated models can more accurately capture relevant cost drivers
- Still relies on workload volume drivers which are not fully exogenous
- Disaggregated to aggregated approach potentially reduces the benefits of balancing the two

Cost pooling options (3)



- Captures the trade-offs and complementary nature of different opex activities
- Assessment of capex and repex potentially more intuitive
- Still some drawbacks to using the totex regression

Cost pooling options (4)



- Why should expenditure be included in an aggregative model? (as opposed to why should expenditure be excluded?)

- Arguably most consistent approach with the CMA recommendations (Bristol Water PR14)
- May be sensible to group other costs (such as elements of capex) with opex only where there is clear justification
- Benefits of aggregative benchmarking (such as trade-offs between activities) are reduced

Workload drivers

- Workload drivers can help control for the effect of different GDN workloads (due to factors outside GDN control)
- As an example, repex is driven by external policy (as well as GDN decisions)
- Models without workload drivers may suffer from omitted variable bias – in particular, for factors that cannot be easily quantified such as network condition
- Can incentivise GDNs to forecast high workloads, even if these are not delivered
- Just a "weighted unit cost assessment"?
- How do we interpret CSVs that include scale and workload variables?

We consider that we should test models with and without workload drivers

Regional factors (1)

- Costs can increase with both density and sparsity
  - U-shaped relationship
  - Option of within-model approach as opposed to ex-ante adjustments
- How to proxy density
  - Total connections / total length of mains (in consultation)
  - Ofwat-style weighted average density variable
- CEPA tested a totex model assuming either linear or quadratic relationship of density with costs
  - Totex are normalised, except for urbanity and sparsity
  - Estimated same totex model with alternative proxy for density
  - Additional test on emergency and repair regressions

Regional factors (2)

Totex model

	Linear	Linear and quadratic	Linear	Linear and quadratic
Totex CSV	0.739***	0.743***	0.713***	0.797***
Density	-0.049**	0.211		
Density squared		0.016		
Pop. density			0.047**	-0.428**
Pop. density squared				0.041**
Time trend	-0.019***	-0.019***	-0.018***	-0.016***
Constant	38.161***	38.398***	36.098***	32.816***
Observations	80	80	80	80
R squared	0.898	0.897	0.920	0.934

Regional factors (3)

	Emergency		Repairs	
	Linear	Linear and quadratic	Linear	Linear and quadratic
Emergency CSV	0.871***	0.930***		
Tot. Ext. Cond. Reports			0.862***	1.083***
Pop. density	0.062**	-0.255	-0.003	-1.244**
Pop. density squared		0.027		0.102**
Time trend	-0.053***	-0.052***	-0.003	0.002
Constant	-9.643***	-9.544***	-5.877***	-4.353***
Observations	80	80	80	80
R squared	0.797	0.800	0.803	0.840

Regional factors (4)

	Emergency		Repairs	
	Linear	Linear and quadratic	Linear	Linear and quadratic
Emergency CSV	0.934***	0.972***		
Tot. Ext. Cond. Reports			0.842***	0.850***
Density	0.333	-18.889**	0.217	-22.068
Density squared		2.141**		2.482
Time trend	-0.053***	-0.051***	-0.004	-0.001
Constant	-11.609***	30.946*	-6.657***	43.216
Observations	80	80	80	80
R squared	0.789	0.798	0.807	0.819

Note: density = number of customers / network length

Regional factors (5)

We intend to discuss regional factors and company specific effects with GDNs in September.

We then see two possible options for our assessment.

Option 1

- Use a future working group to discuss regional factors
- Focus solely on two-way adjustments
  - Including regional wages and urbanity/sparsity effects
  - Excluding company-specific effects
  - GDNs agree to share relevant draft Business Plan information/data

Option 2

- No sharing of regional factors
- Case-by-case assessment

Approach to econometric analysis

- How we should build and test our models

Estimation techniques	Model specification	Model selection criteria
• OLS • DEA • SFA	• Cost aggregation • Cost drivers • Functional form	• Statistical tests • Model development phases

Approach to econometric analysis

Q1. What model estimation options should be considered for our cost assessment and why?

Q2. Do you agree with our proposed criteria for developing potential cost pools? If not, what additional criteria do you propose and why?

Q3. Should we continue to use the Cobb-Douglas functional form? If not, why?

Approach to econometric analysis

Q4. Do you agree with the proposed model selection and model development phases?

Phase 1

- Identify preferred models based on:
  - Predictive power (adjusted R-squared)
  - Statistical robustness
  - Economic / engineering rationale
  - Are the results consistent with the rest of the price control?

Phase 2

- Put preferred models through robustness testing:
  - Removal of years / companies from panel
  - Random effects
  - Within sample forecasting (when appropriate)

Aggregated econometric analysis

- Top-down and relatively more aggregated modelling approaches

Totex modelling	Middle-up modelling	Other approaches
• Disaggregated to aggregated analysis • CSV	• Opex • Capex • Repex	• Totex and opex plus modelling • Trade-offs between opex activities

Aggregated econometric analysis

Q5. Should the cost driver of the totex regression model be determined by the cost drivers of the 'bottom-up' models, or should the totex regression model account for different explanatory variables? Why?

Q6. What could be appropriate cost drivers in middle-up models for opex, capex and repex? Why?

Q7. For which opex activities are there trade-offs that support the rationale for testing 'totex and opex plus' modelling?

Q8. Are there other particular costs that we should aggregate and test in our analysis?

Disaggregated econometric analysis

– Bottom-up and relatively more disaggregated approaches

Cost aggregation	Cost drivers
• Opex plus modelling • Separate assessment of repex, capex	• Workload drivers • Existing drivers • Alternative drivers

Disaggregated econometric analysis

Q9. Are there trade-offs between opex and capex activities that support the rationale for considering 'opex plus' modelling?

Q10. Which cost areas should be assessed using workload drivers as opposed to other cost drivers? Why?

Q11. Should repex (or some categories of repex) be excluded from our regression analysis and assessed using other techniques?

Q12. Are there other approaches to disaggregated benchmarking that we should consider?

Non-econometric analysis

– Our assessment of business support costs across all sectors

Trend analysis	Benchmarking	Expert review
• Simple tool • Can inform our level of confidence	• Ratio • Econometric • Aggregation options • Within sector, cross sector, external	• Material categories • Combine with other approaches • IT&T

Non-econometric analysis

Q13. Should we assess business support costs at a group level in order to address cost allocations across companies within groups?

Q14. Which types of business support costs should be benchmarked, and how should they be benchmarked?

Q15. Which types of business support costs should be excluded from benchmarking?

Regional factors and company-specific effects

– How should we account of these and how they should be justified

Pre-modelling	Within-model
• Appropriate when costs can be clearly identified • Strong precedent • Urbanity/sparsity adjustments rely place greater reliance on judgement	• Can be measured against model specification tests • Only feasible if there is suitable data • Potentially increased complexity

Regional factors and company-specific effects

Q16. How should we estimate and model the impact of regional factors?

Q17. Do you agree with the proposed criteria for justifying regional cost factors that we have outlined?

Real price effects and ongoing efficiency

– How to treat frontier shift

Real price effects	Ongoing efficiency	Frontier shift
• Justification • Materiality	• Interactions with price control • Setting an ambitious challenge	• Understanding outturn frontier shift

Real price effects and ongoing efficiency

Q18. What RPEs should we account for, how should we gauge materiality, and what criteria should we use for index selection?

Q19. What common input and expenditure categories are appropriate for structuring RPEs?

Q20. How should we identify an appropriate ongoing efficiency assumption?

Q21. How should we determine frontier shift?

Combining the elements of our cost assessment

– How we arrive at overall totex allowances

Efficiency benchmark	Combining analysis
• Use of upper quartile • Glide-path • Avoiding cherry picking	• Use of historical v forecast costs • Weightings applied to analysis • BPI interaction

Combining the elements of our cost assessment

Q22. Should we set the efficiency benchmark at the upper quartile level?

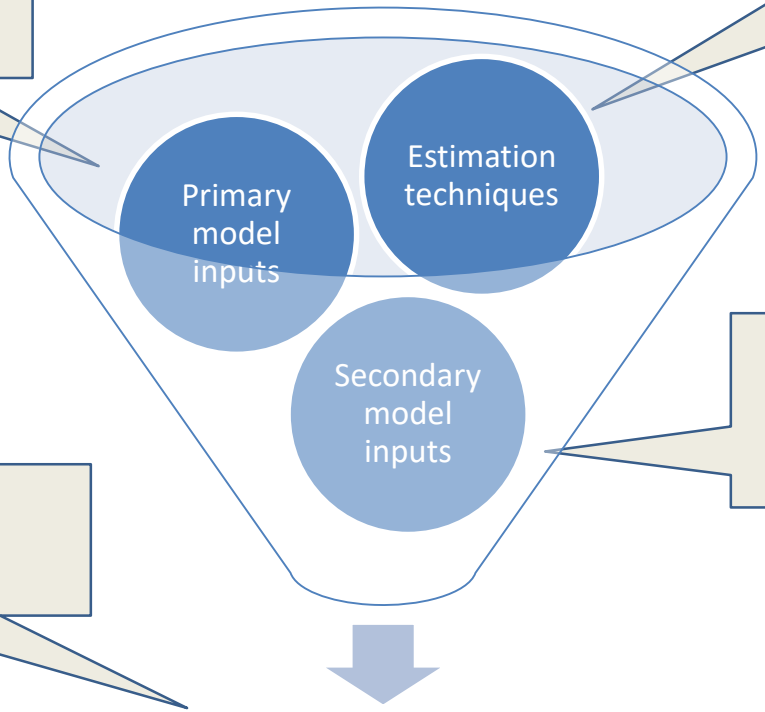
Q23. Are there types of expenditure that we should model using only historical or forecast data?

Q24. If we use a combination of aggregated and disaggregated modelling approaches, how should we determine the weight we apply to each?

Key activities

Cost pools, cost drivers – CEPA's 4 options provide a ***starting point***

Should we test alternative estimation techniques?

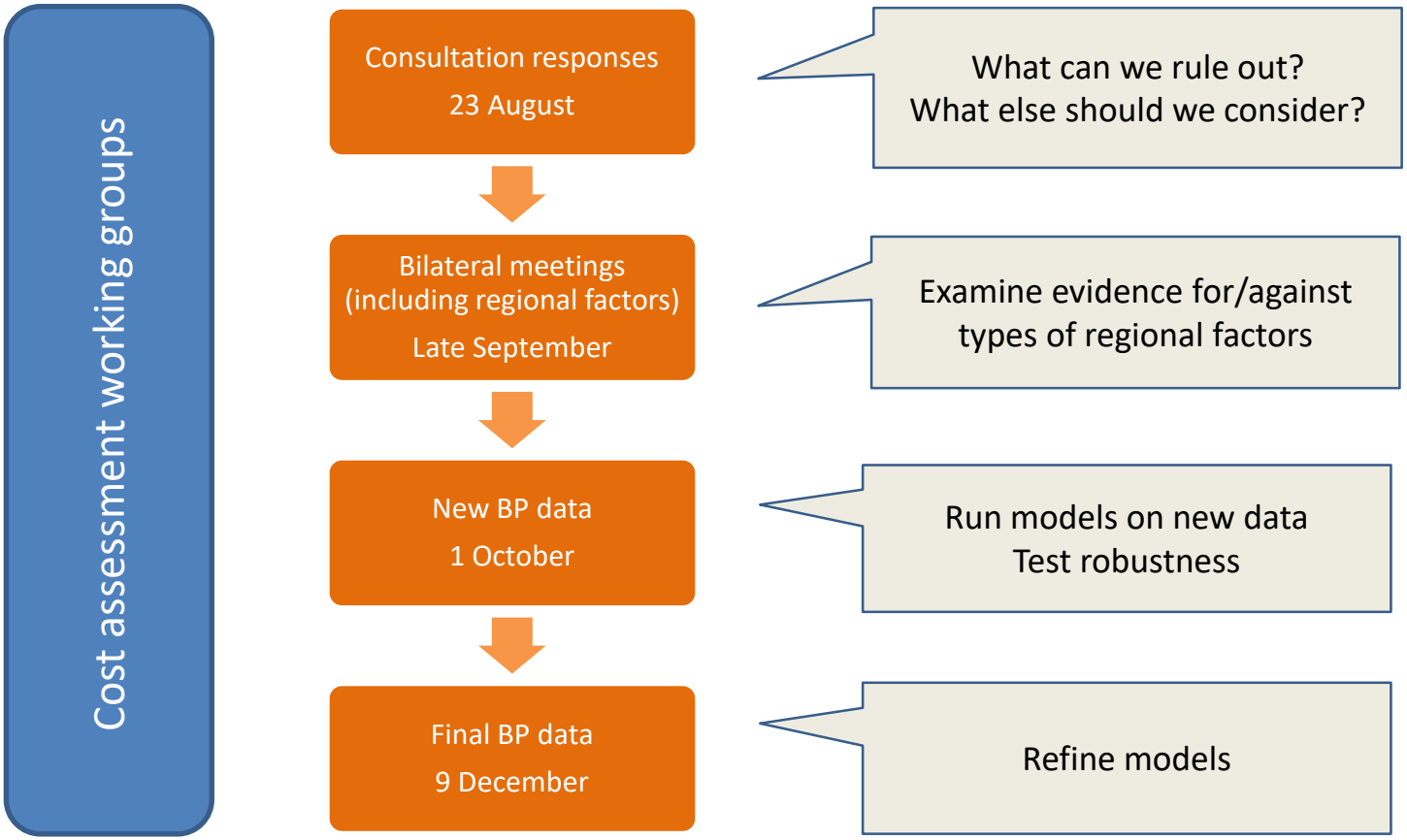


Historical v forecast data, workload adjustments, time trends, regional cost factors

Benchmarking process, interactions with BPI

Refine models

Indicative timeline and activities



Business plan data templates (BPDTs)

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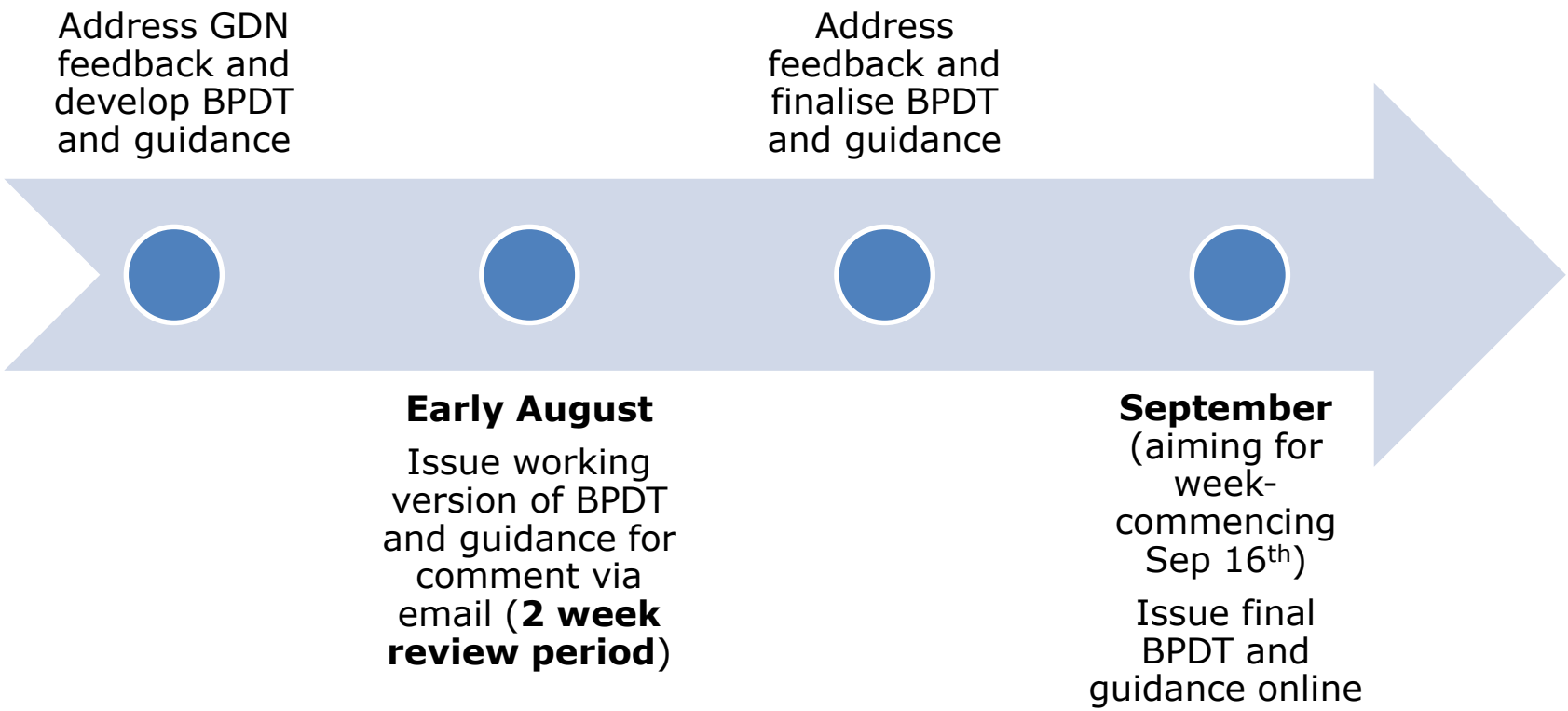
Final BPDT development timeline



October business plan submission

- As per Ofgem's business plan guidance document, the draft BPDT templates are to be reused for the October submissions
- As there are known formula errors in the draft BPDT (issued in March), we **intend to republish a corrected version of the draft BPDT**
  - This corrected version will have amended formulas, but there will be no change in the data asked for in the BPDT for October
  - We aim to republish in the next two weeks

1. Inclusion of a totex summary table

- Net controllable opex, net capex, net repex
- Efficiency assumptions (e.g. catch-up and ongoing)
- Excluding RPEs
- Excluding highly uncertain costs where possible
- Excluding non-controllable and non-price control costs

2. What is the most effective way to capture uncertain costs in the BPDT?

- Generic table to capture costs (and/or workload)?

Final BPDT discussion points continuted

3. Is there a way to, and need to, separate out incremental and ambition costs?
   - E.g. any additional costs incurred by the emergency function that cannot be delivered by baseline funding.
   - E.g. any additional costs associated with ambition – over-and-above a baseline target.
4. What is the best way to capture cyber resilience costs in the BPDT (if at all)?
5. Possibility of capturing the level of price accuracy for project-based capital works
   - E.g. cost accuracy range/stage-gate estimate

Final BPDT discussion points continuted

6. How should we deal with CISBOT in the BPDT?
   - Repex, opex or both?
7. We are interested in further exploring historic efficiency performance in the BPDT
   - E.g. asking for historic efficiency performance as well as forecasts
   - E.g. separating out catch-up efficiency and ongoing efficiency for GD1 actuals

8. Input and expenditure categories used in the assessment of RPEs

- What is the most effective way to capture labour? Direct/contract, general/specialist, etc.
- Are the GD1 expenditure categories of direct opex, indirect opex, capex, repex mains, and repex services still relevant?

CAWG forward plan

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Provisional CAWG forward plan for discussion

September

- Bilateral meetings
- Opportunity to have a call/meeting to discuss cost assessment consultation responses as a group

Later in the year

- Open to holding CAWGs if there is demand. Potential topics:
  - Further discussions on modelling
  - Regional factors workshop
  - Anything else?

Summary

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Summary

Any other business

Action items

ofgem Making a positive difference for energy consumers

Our core purpose is to ensure that all consumers can get good value and service from the energy market. In support of this we favour market solutions where practical, incentive regulation for monopolies and an approach that seeks to enable innovation and beneficial change whilst protecting consumers.

We will ensure that Ofgem will operate as an efficient organisation, driven by skilled and empowered staff, that will act quickly, predictably and effectively in the consumer interest, based on independent and transparent insight into consumers' experiences and the operation of energy systems and markets.

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