

Early Competition Models

Workshop 2 – 22 October 2019

Today's agenda

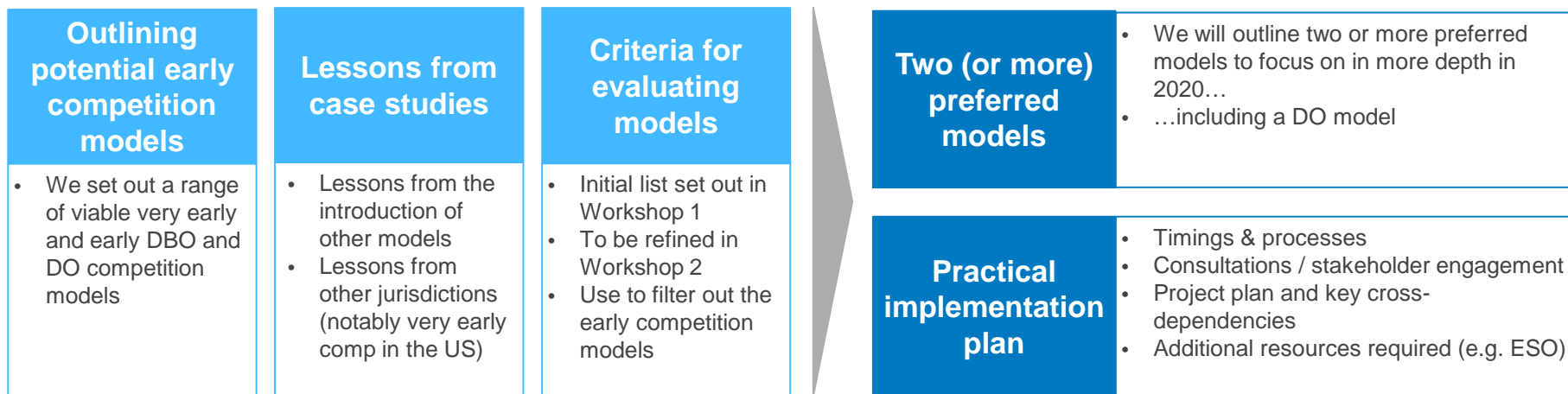
1	Welcome and introductions	Hannah Kirk-Wilson / Sally Thatcher	9:45 – 10:00
2	Recap from previous Workshop and objectives for today	Jason Mann / Alaric Marsden	10:00 – 10:30
3	Model variants: Design, Build and Own (DBO)	Jason Mann / Alaric Marsden / Greg Yap / Grace Edgar	10:30 – 12:30
Lunch			12:30 – 13:00
4	Model variants: Design Only (DO)	Jason Mann / Alaric Marsden / Greg Yap / Grace Edgar	13:00 – 14:30
5	Next steps	Hannah Kirk-Wilson / Sally Thatcher	14:30 – 15:00
6	Spare		15:00 – 15:30

In Dec 2019 we will submit a project update to Ofgem



We are currently working on three key inputs...

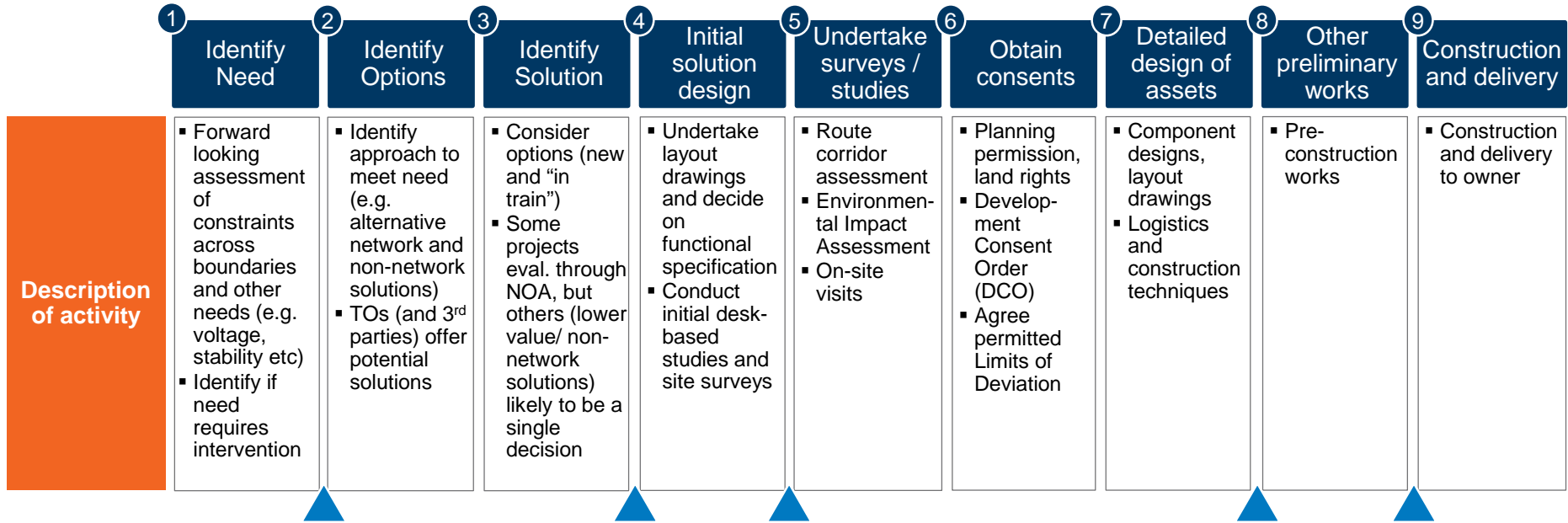
...that will form the basis of our Dec update



1. Recap on electricity transmission competition models



The typical investment lifecycle of a transmission project has nine key steps...

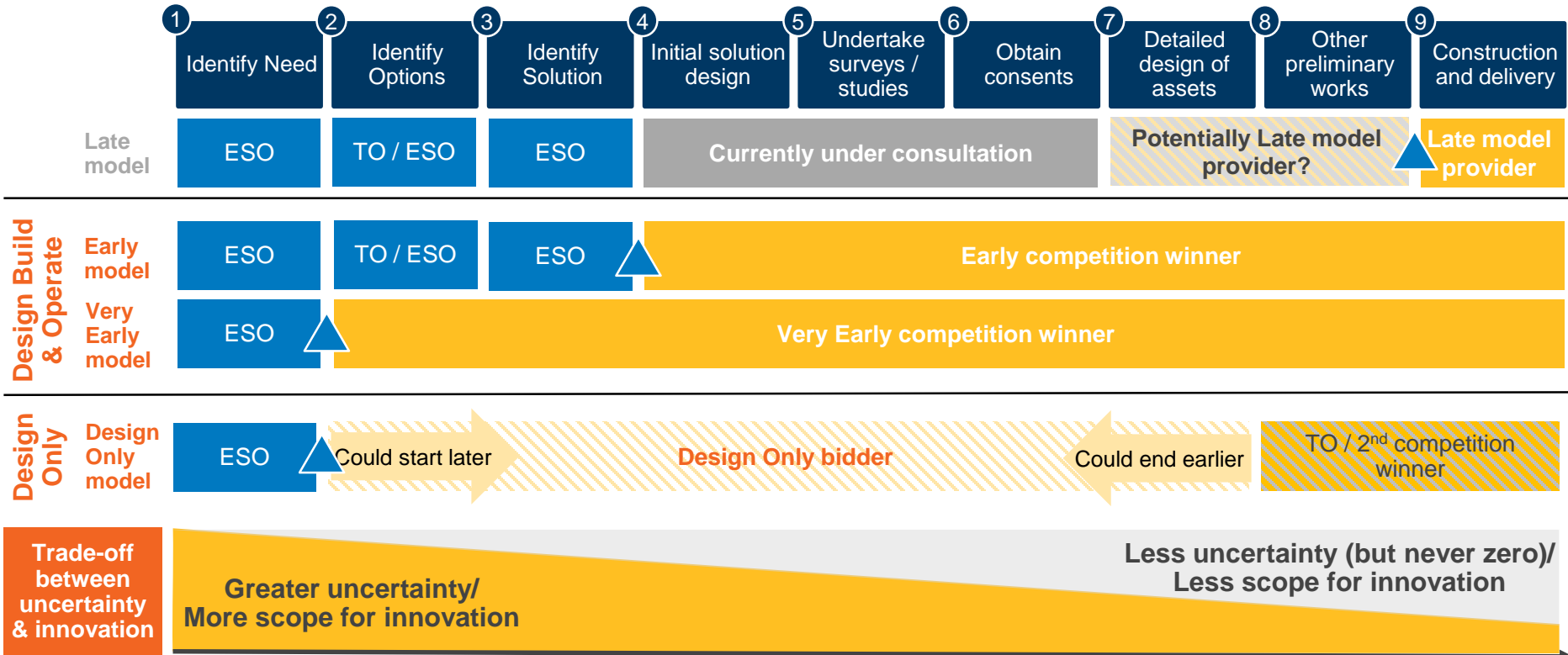


...and competition can be introduced at various points of the investment cycle

¹ Some of the processes may be different in Scotland (e.g. no DCO required)

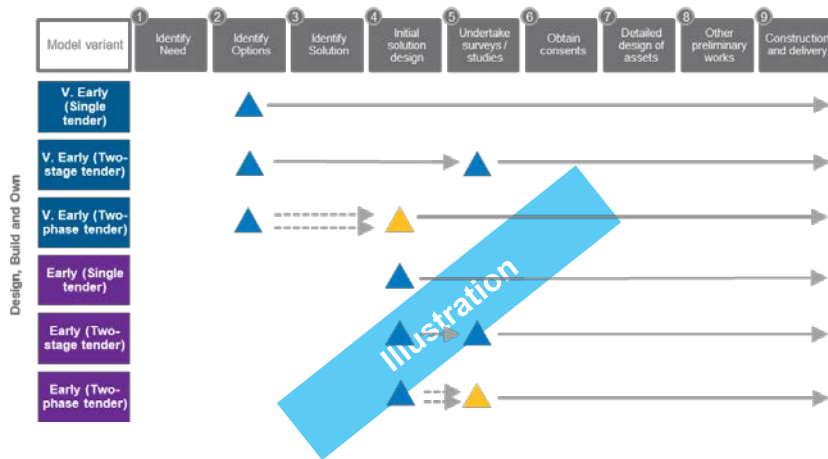
² Some lifecycle steps may not occur in the order described (e.g. some environmental impact assessment may occur at an earlier stage to help inform solution)

The choice of competition model must balance the trade-off between innovation and uncertainty

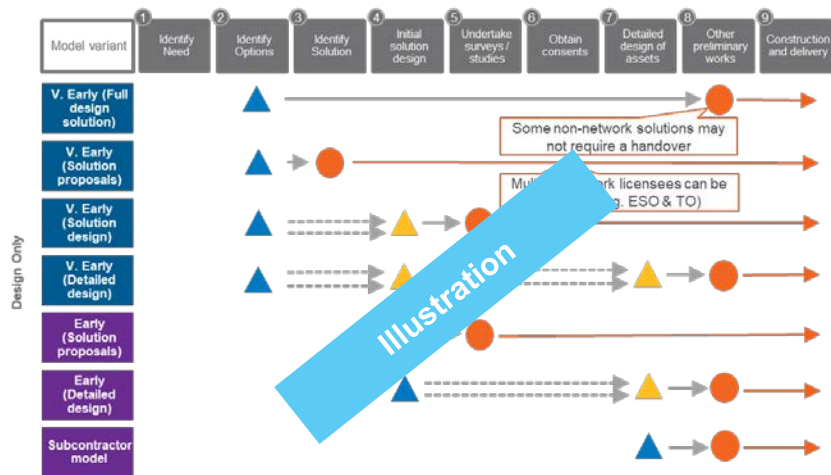


Today we are zooming in on potentially workable models discussed at the previous Workshop

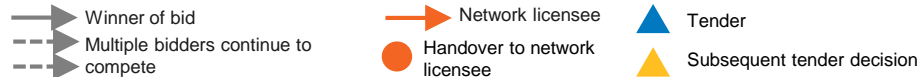
We discussed a broad range of DBO...



...and DO models in Workshop 1

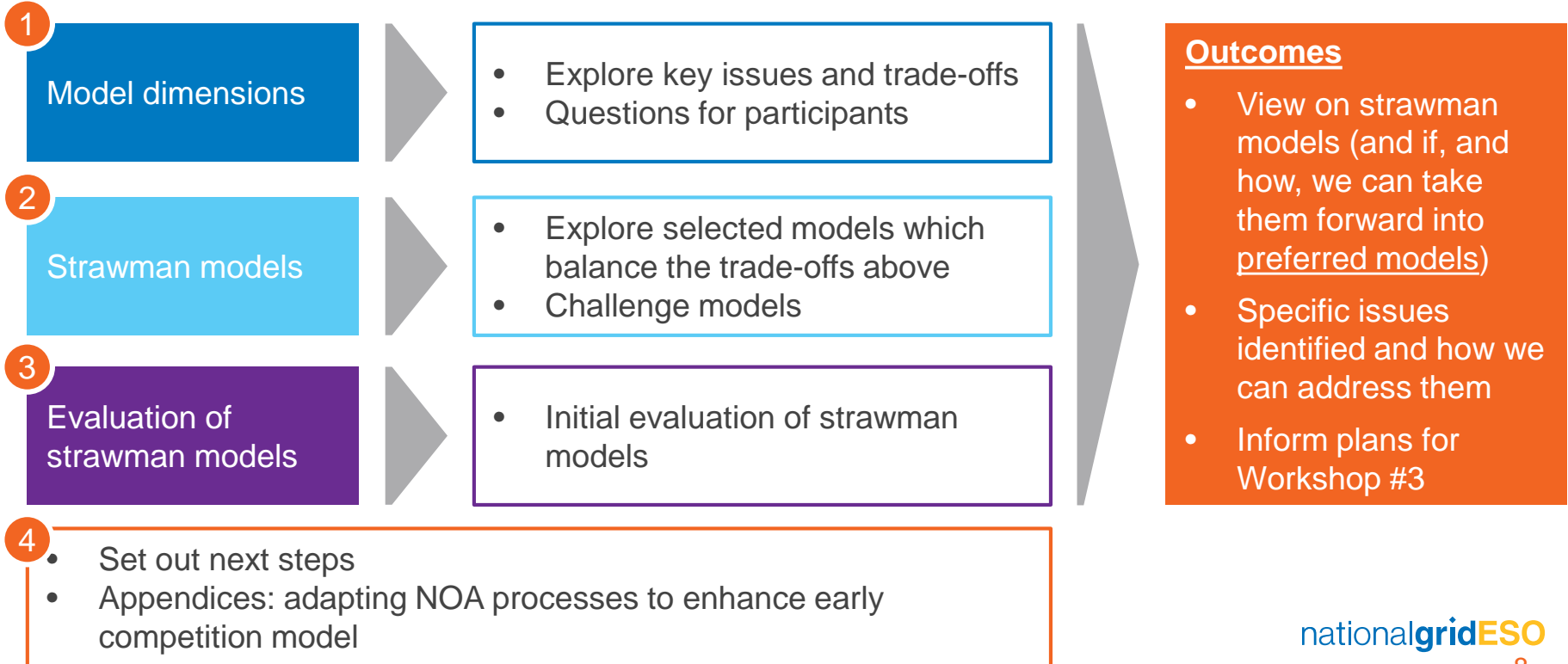


- In this Workshop, we further test potential workable models
- We will first identify potential “Strawman” models by flexing model dimensions...
- ...before passing an initial assessment of these potential models against evaluation criteria
- Both the model dimensions and evaluation criteria that we use have been updated to reflect your Workshop 1 feedback

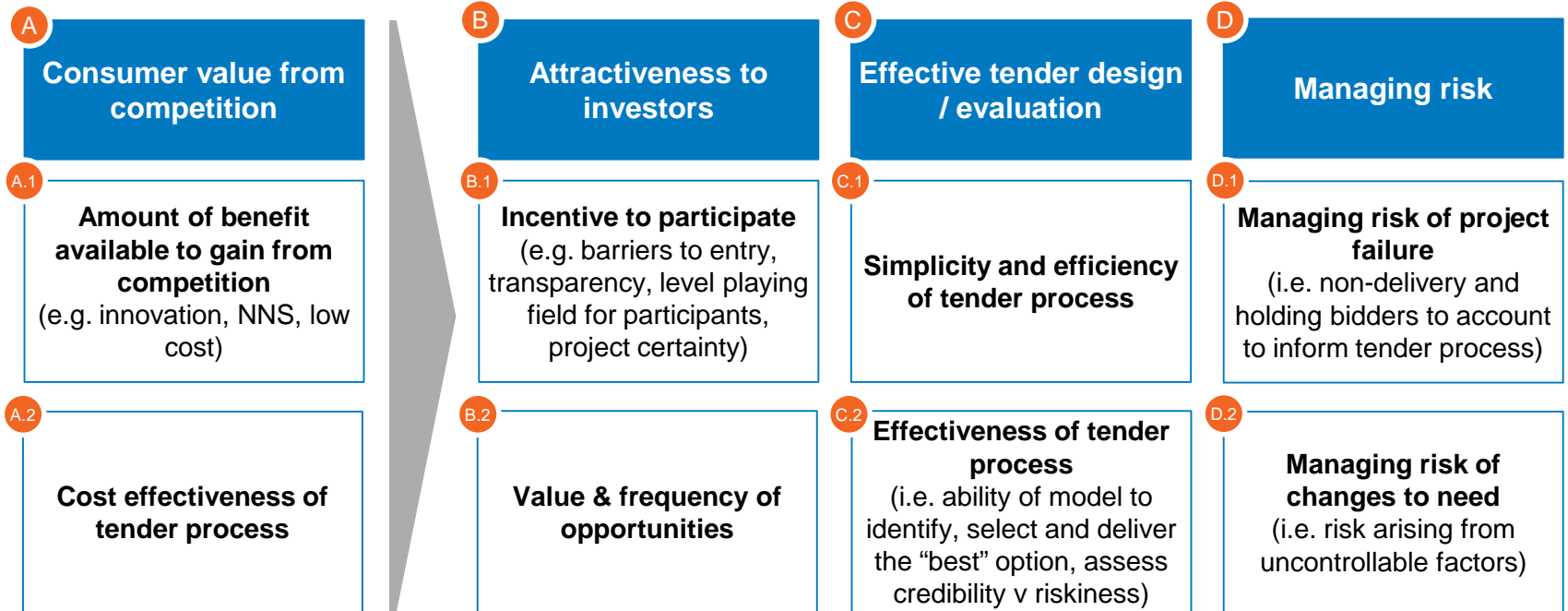


In this Workshop we will identify and test several strawman models...

For each: DBO and DO model variants



... with a set of criteria to evaluate these strawman models



NNS = non-network solutions

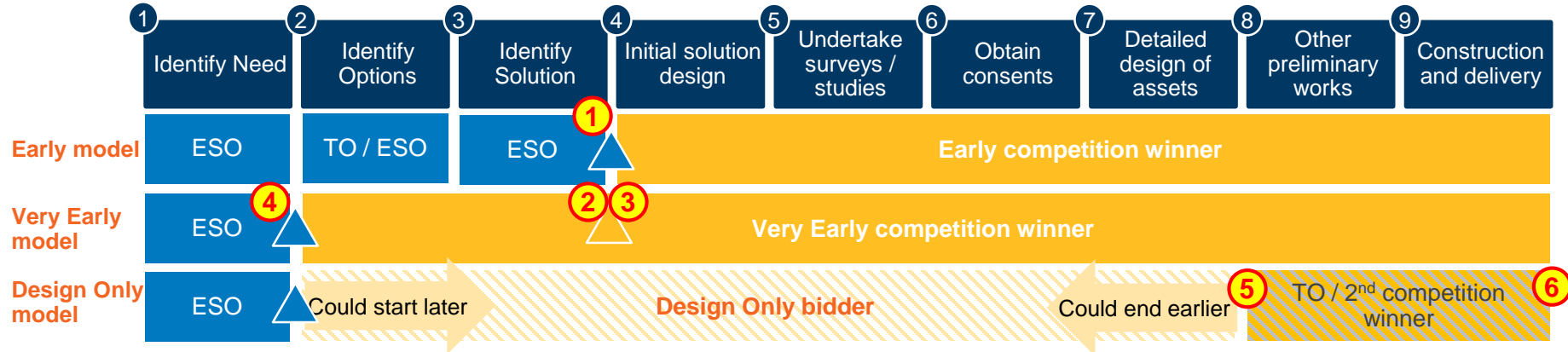
2a. Identifying the different early competition models & issues

Design, Build and Own (DBO) models:

- *Dimensions*
- *Strawman*
- *Evaluation*



Six key dimensions drive the identification of potentially workable model variants



- 1 Tender point**

 - Where to introduce tender (trade-off between innovation & uncertainty / difficulty in assessing bids)
 - ITT and reference design developed by ESO (so TO can actively participate)

2 Scope of competition

 - Single tender point or shortlisting bidders – may be decided through NOA which already allows alternate opportunities to progress in parallel
 - Recovery of sunk cost / devex?

3 Tender design and evaluation

 - What evaluation criteria (cost, uncertainty, qualitative factors)?
 - Extent to which NOA can be adapted to facilitate and evaluate bids?
 - Post-tender change mechanisms

4 Backstop solution

 - Potentially developed in parallel and acts as default solution in absence of competition or if deliverability of solution uncertain
 - Trade-off between extra cost and insurance policy

5 Handover and IP issues

 - Would the handover be to the incumbent TO or the winner of a 2nd competitive tender?

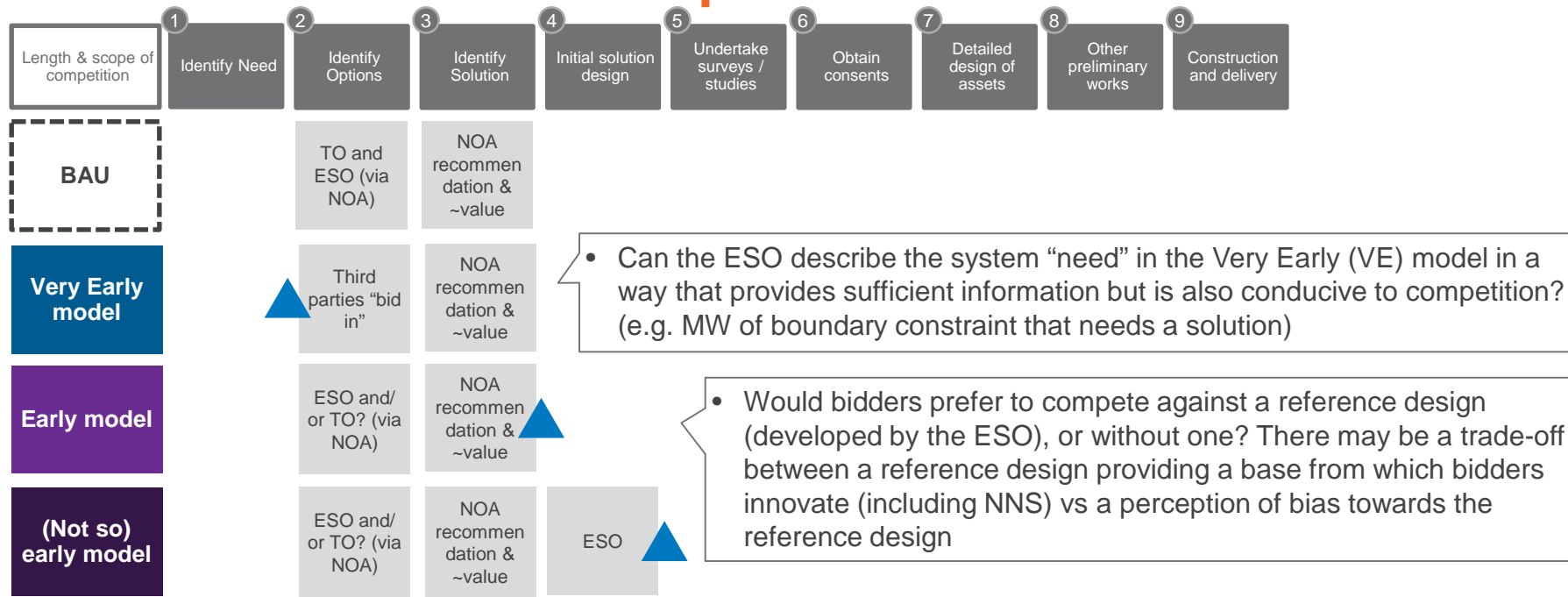
Greater issue in DO models

6 Ex-post accountability (for non-asset owners)

 - How are bidders kept accountable?
 - What if the solution is non-deliverable or does not meet standards?

Greater issue in DO models

Dimension 1: The starting tender point impacts the degree of information that can be provided to bidders



- What level of TO involvement is appropriate during stages 2 and 3? At the previous Workshop, concerns were raised by TOs about the impact of early competition on meeting SQSS licence obligations. We need to understand this in detail plus consider how it might impact the competitive process.

Dimension 2: Multiple bidders could be shortlisted in an initial stage of the tender before a final selection is made



Single tender variants (both V. Early and Early)

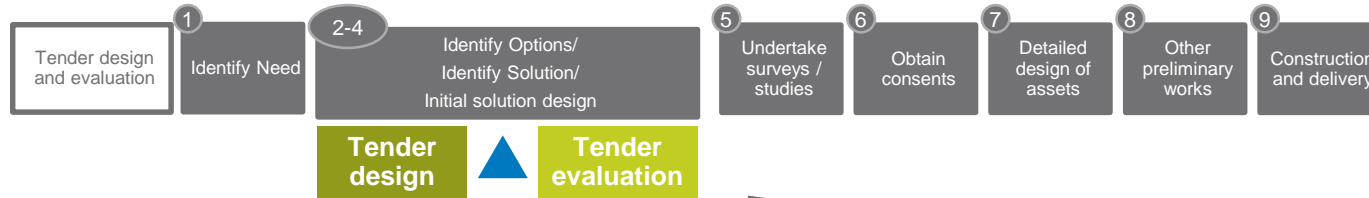
Two-phase tender variants (both V. Early and Early)



- Does shortlisting give bidders sufficient confidence that they may ultimately win the competition, or would it deter participation?
- Would shortlisted participants require funding to continue?
- Extended process allows more information to be revealed before a final decision is made when there's more certainty
- When is the latest date a single winner needs to be committed? Is before consenting sensible to avoid duplicative costs that may act as a deterrent?

Cost saving illustration (Appendix A.1)

Dimension 3: Cost is likely to be only one of multiple factors to consider when selecting the winning bid...



What information / metrics should bidders provide?

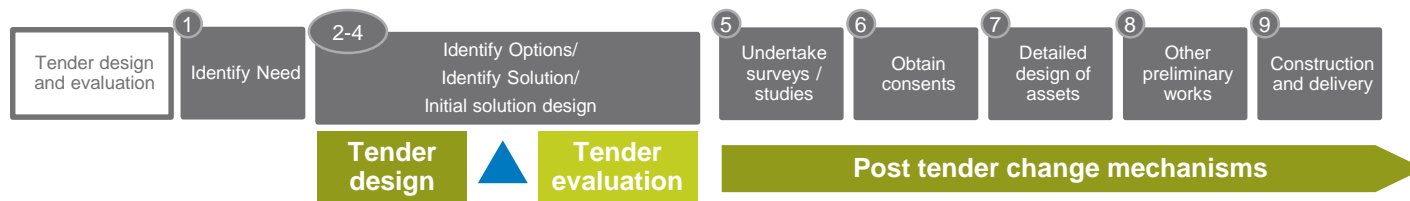
- a) Traditional criteria: cost, technical design & deliver and financing strategy
- b) Additional quantitative criteria: assessment of “partial” bids; and firmness of the bid (e.g. cap & floor, sharing factors and cost re-openers)*
- c) Qualitative criteria: environmental, robustness to future changes

What has / has not worked well in other competitive processes, e.g. OFTOs?

Next steps in developing workability of models:

1. Evaluation mechanism to assess bids
2. Incorporating ability to assess partial bids in evaluation mechanism
3. Consideration of how to assess NNS / other innovative options that cut across multiple “needs”

Dimension 3: ... with post tender change mechanisms as a necessary feature to manage risk



What post-tender change mechanisms would need to be put in place to balance risk allocation among parties?

- a) Risk of project changing (tech failure / delays / cost changes / liquidation / failure to achieve consents)
- b) Risk of system need disappearing or changing due to changes in forecast demand and supply

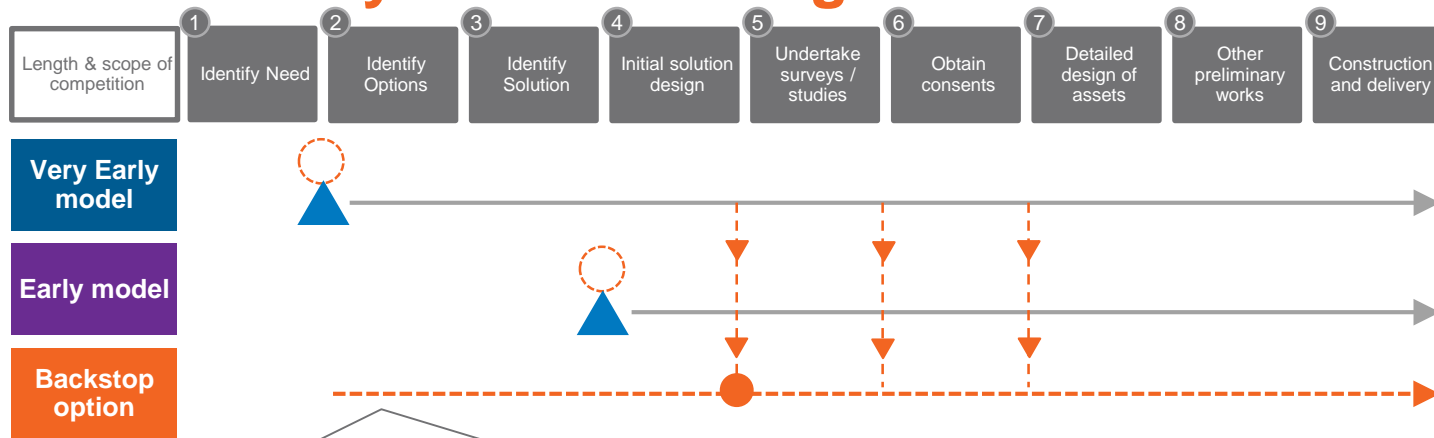
Trade-off between harsher penalties vs incentive to participate needs to be considered in tender design (e.g. Trafford in CM) and non-credible bids need to be uncovered

May be part of bid submission – opportunity to “flex” solution up or down

More detail on bid evaluation criteria (Appendix A.1)



Dimension 4: running a backstop option in cases where deliverability of the winning solution is uncertain



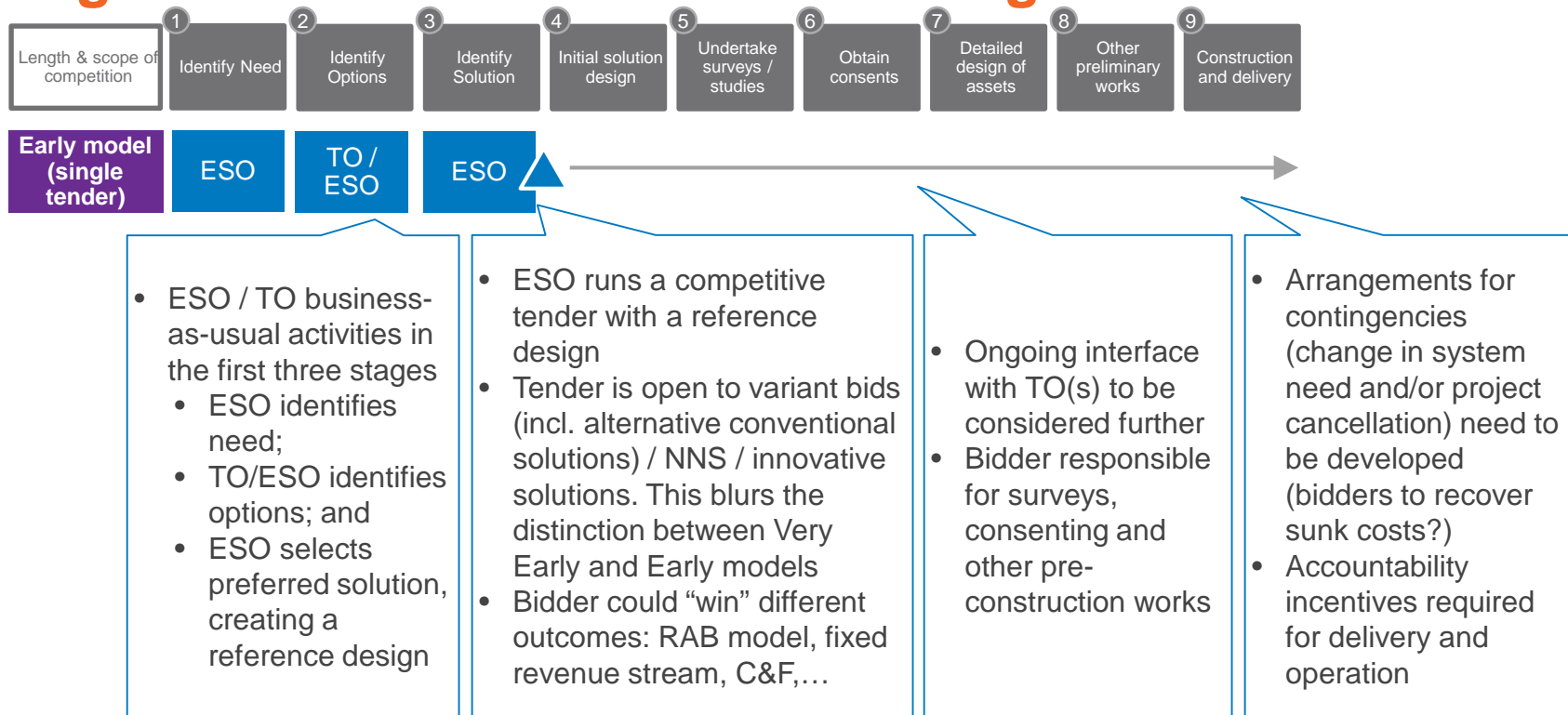
Backstop option could be developed in tandem to the winning bidder solution by the incumbent TO, up to the end of Stage 4. This could provide customer protection as would not need to revert back to the start of the process

- What key benefits or disadvantages exist from running a parallel backstop option?
- How far should the backstop option go on for?

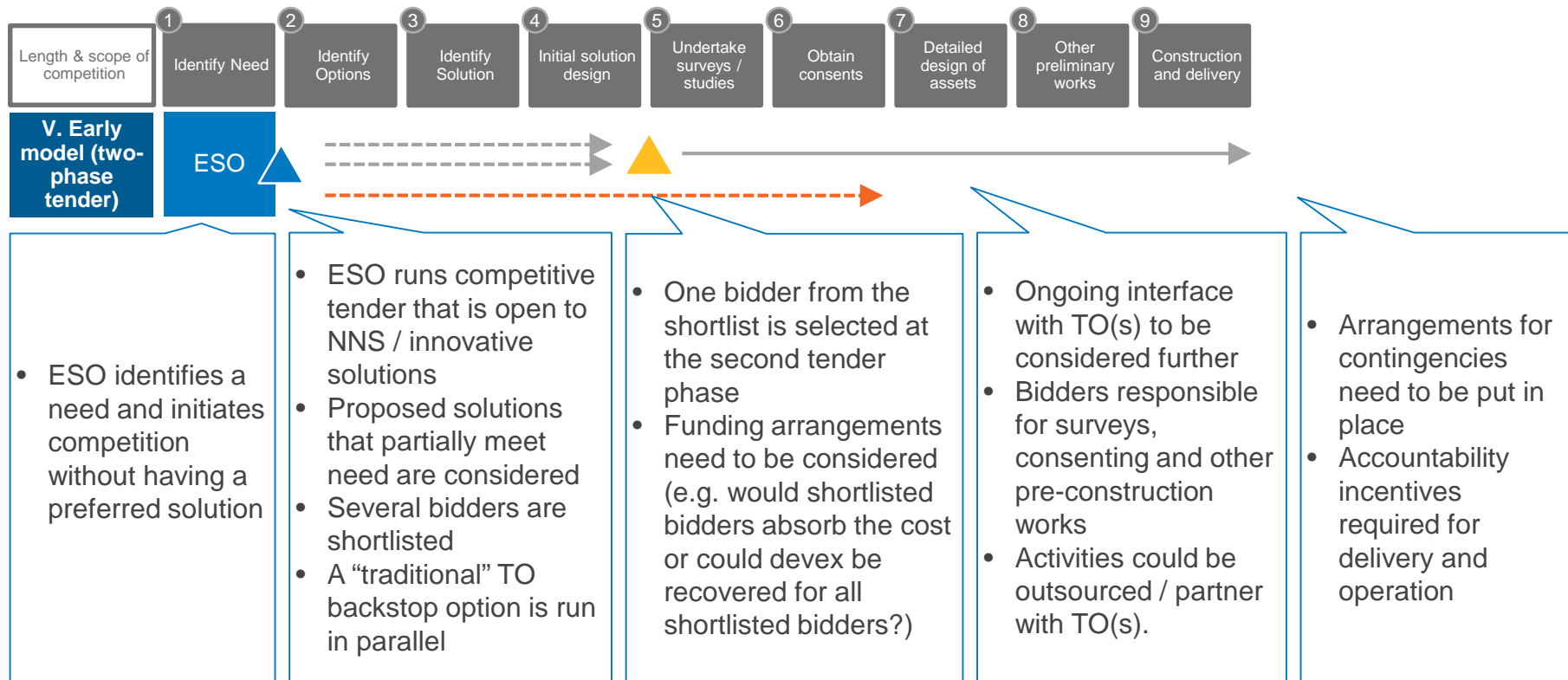
Case study: In NYISO, a need is tendered out at very early stages. The incumbent TO is required to provide a backstop solution, but may also provide an “alternative regulated option” to beat their backstop solution. If a winning bid fails during delivery, NYISO may revert to the backstop solution

A backstop option refers to the counterfactual default solution that would be built in the absence of competition (TOs could offer an additional innovative solution). This is different to a reference design solution

Strawman #1: we set out two DBO model variants that might be workable – one as a “straightforward variant” ...



Strawman #2: ... and a second potentially workable DBO variant that maximises innovation



2b. Identifying the different early competition models & issues

Enhanced competition model:

- *Model*
- *NOA*
- *Evaluation*



Our initial thinking has revealed two key challenges to early competition models...

1

The earlier the competition model, the greater the potential benefit of innovation, but greater challenge to ensure decision is optimal throughout especially in a “one shot” competition model

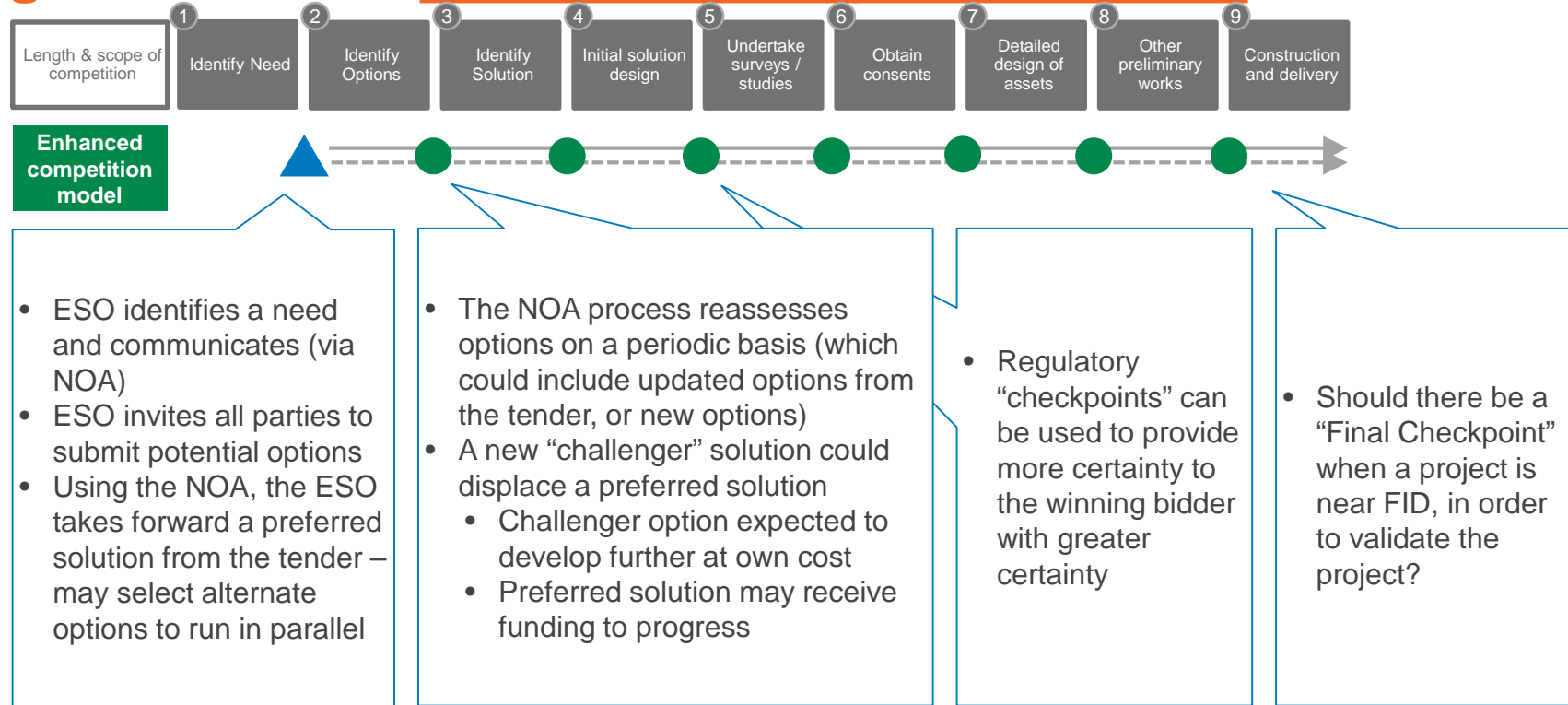
2

There is a risk of changing need given the potential change in forecast demand and supply patterns amidst long project timelines

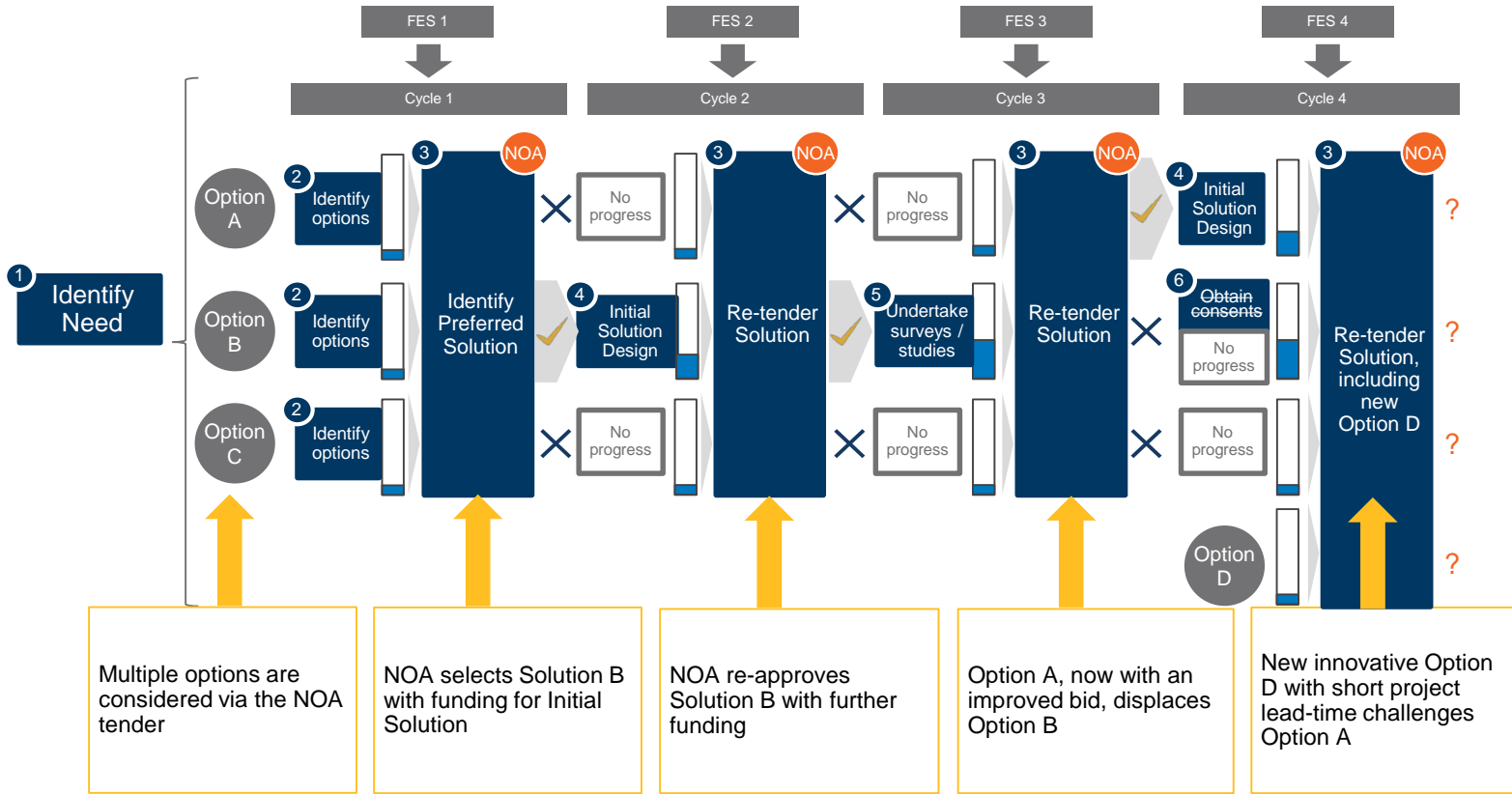


Adapting the NOA as a “clearing engine” may provide a solution to these issues

Strawman #3: applying an iterative NOA process could give rise to an Enhanced Competition Model



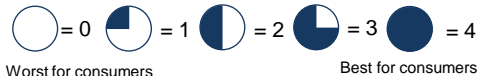
Example of the Enhanced Competition Model to extract competitive benefits across all stages



Strawman #3: The Enhanced Competition model might offer greater benefits than the other models

Assessment criteria	A.1 Amount of benefit available to gain from competition	A.2 Cost effectiveness of tender process	B.1 Incentive to participate	B.2 Value & frequency of opportunities	C.1 Simplicity and efficiency of tender	C.2 Effectiveness of tender process	D.1 Managing risk of project failure	D.2 Managing risk of changes to need
Early model (single tender)								
V. Early model (two-phase tender)								
Enhanced Competition model								

These models were assessed on slide 19



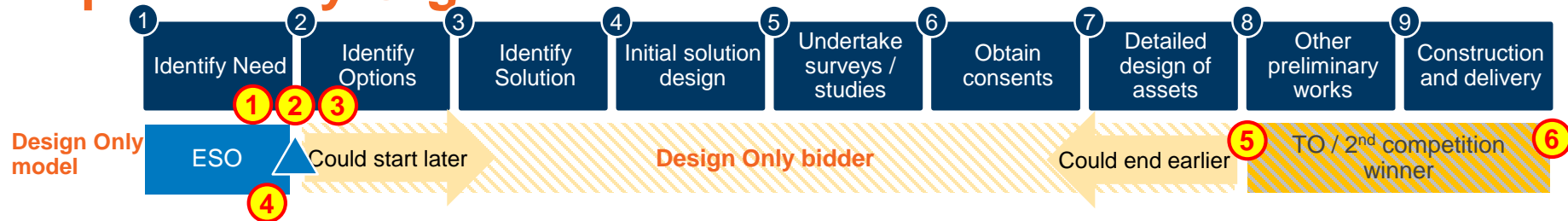
2c. Identifying the different early competition models & issues

Design Only (DO) models:

- *Dimensions*
- *Strawman*
- *Evaluation*



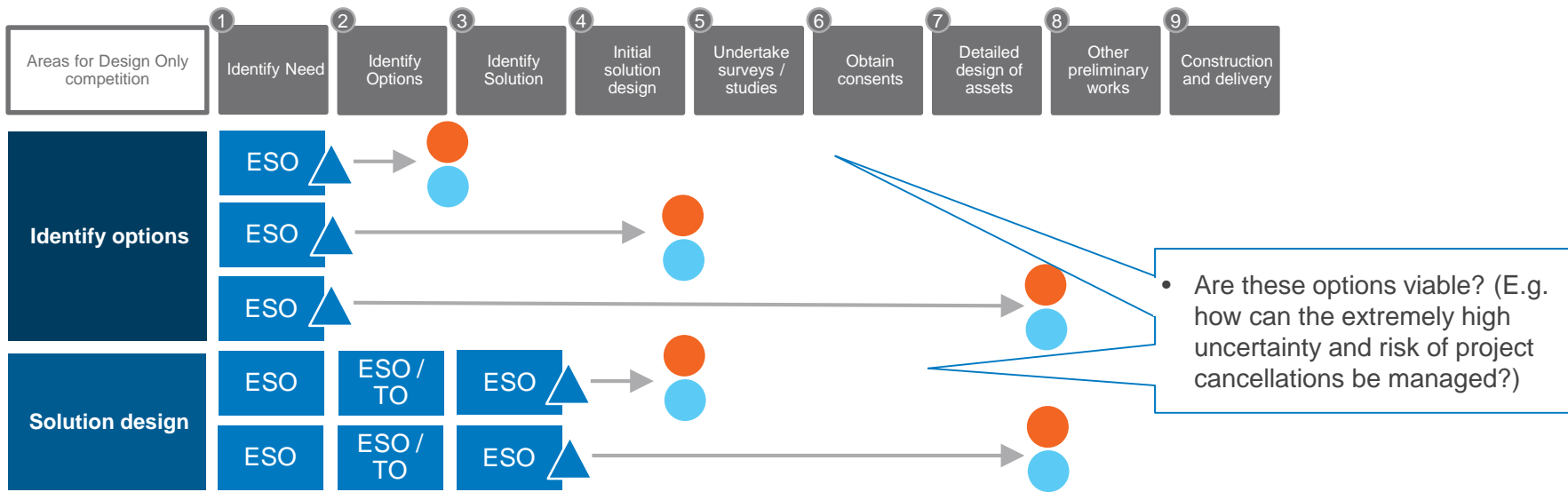
We have developed a DO model of early competition, as requested by Ofgem...



...by flexing the model parameters, some of which are more important in making a DO model workable

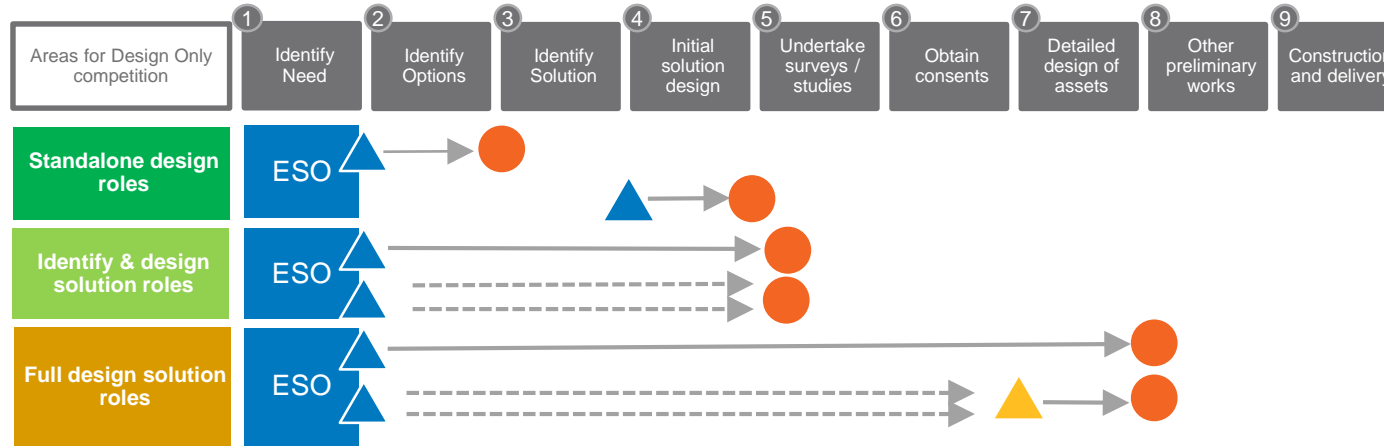
- | | | | | | |
|--|--|---|--|--|--|
| <p>1 Tender point</p> <ul style="list-style-type: none"> Where to introduce tender? What is the extent of the DO winning bidder's role? | <p>2 Scope of competition</p> <ul style="list-style-type: none"> Single tender point or shortlisting bidders – may be decided through NOA which already allows alternate opportunities to progress in parallel Recovery of sunk cost / devex? | <p>3 Tender design and evaluation</p> <ul style="list-style-type: none"> What evaluation criteria? Particularly need to consider credibility What “size of the prize” is sufficient to encourage participation? Post-tender change mechanisms | <p>4 Backstop solution</p> <ul style="list-style-type: none"> Developed in parallel and acts as default solution in absence of competition or if deliverability of preferred solution uncertain Could this still be used in a DO model? | <p>5 Handover and IP issues</p> <ul style="list-style-type: none"> Would the handover be to the incumbent TO or the winner of a 2nd competitive tender (late CATO)? <p>Greater issue in DO models</p> | <p>6 Ex-post accountability</p> <ul style="list-style-type: none"> How are bidders kept accountable for solution workability? What if the solution is non-deliverable or does not meet standards? <p>Greater issue in DO models</p> |
|--|--|---|--|--|--|

Dimension 1: there are different variations to the role of a DO winner



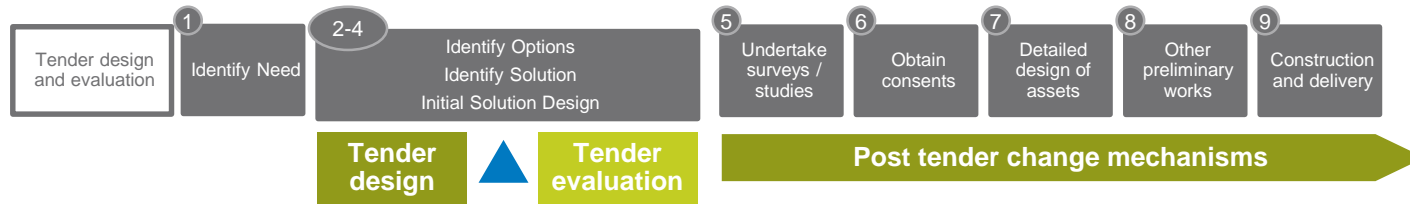
- How much should bidders do?
 - Can sufficient innovation be delivered after stage 3 or does innovation need to come earlier?
 - Should they take on consenting?
- Which of the following scenarios would make a DO model more attractive to bidders:
 - Subcontract consenting to a 3rd party?
 - Collaborate with the TO (what safeguards are required to encourage effective collaboration and to protect IP)?
 - Only focus on the pre-consenting stage (with appropriate mechanisms in place to keep bidders accountable)?

Dimension 2: Multiple bidders could be shortlisted in an initial stage of the tender before a final selection is made



- Scope for competition increases:
 1. as the size of the DO role increases; and
 2. if bidders are initially shortlisted and continue to compete to be the preferred bidder

Dimension 3: Design Only competitions may present additional challenges to those in DBO competitions

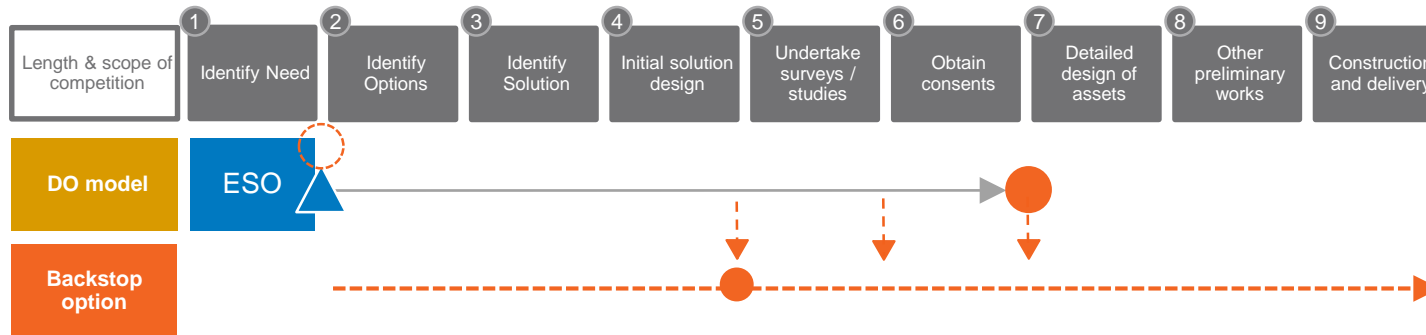


- How can bidders demonstrate that they have considered the full lifecycle of the proposed solution (even though they only compete for “ideas”)?
- What do bidders compete for:
 - One-off reward ‘pot’?
 - Opportunity to pilot now and monetise later?
 - Share of future benefits from their idea?

- How can ‘unproven bids’ be effectively evaluated / could there be a separate funding mechanism for FOAK solutions?
- Under what conditions would there be a need for a backstop solution?

- Post-tender changes seem likely to be an even greater risk in DO models due to a lack of accountability – we discuss this further in slide 33

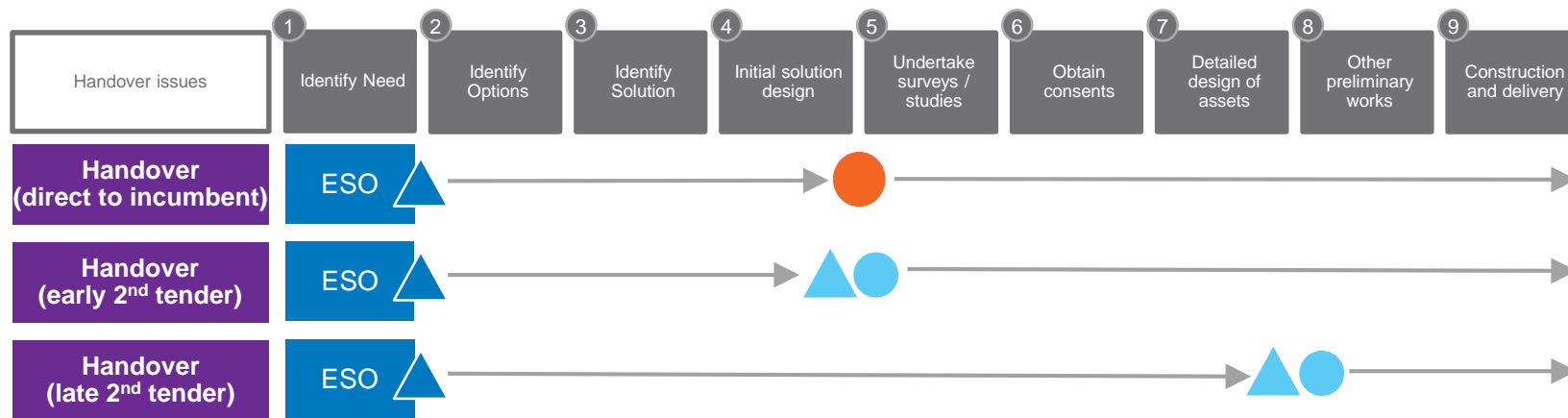
Dimension 4: Is a backstop solution relevant under a DO model?



- The backstop solution is a traditional DBO solution

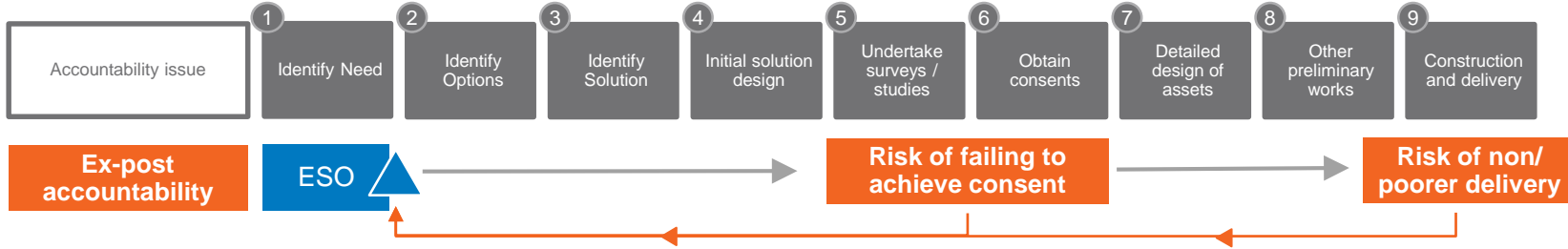
- Is there more value in having a backstop solution in a DO model compared to in a DBO model?

Dimension 5: method of handover / IP issues



- How can bidders' IP be protected: (1) licensing to the TO; (2) prevent misuse of IP by other parties in future bids (e.g. via patents)?
- Will the DO model incentivise particular types of innovation (e.g. patentable innovations) to mitigate perceived risk that bidders' IP is at risk?
- Would Ofgem envisage that TOs are mandated to cooperate with the third party DO winners? If so, how?

Dimension 6: ex-post accountability



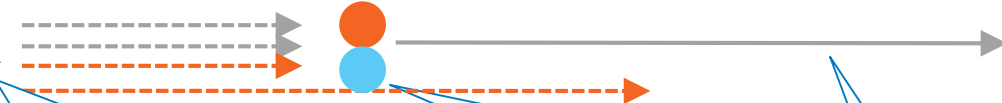
- How can DO bidders be incentivised to develop solutions that are ‘consentable’ and ‘deliverable’?
 - Financial incentives (positive or negative)
 - Mandate for TO(s) to form partnerships / consortia
 - Other?
- What should happens if the “idea” fails or do not meet the required standards?

Strawman #4: potential Design Only model variant?



V. Early DO model (two-phase tender)

ESO



- ESO identifies a need and initiates competition without having a preferred solution

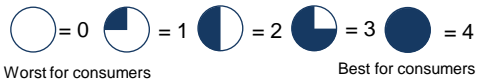
- ESO runs a competitive tender, open to NNS / innovative solutions
- Proposed solutions that partially meet need are considered
- Several bidders are shortlisted
- A “traditional” TO backstop option is run in parallel
- Cost recovery will need to be considered (either developer or customer)

- Possible long-term interface with TO(s) to be considered (to hold DO winner accountable)
- IP protection critical to enable bidder to re-use in subsequent tenders
- Price of design solution needs to be considered – based on ex-ante expected benefits or actual ex-post? (e.g. reward “pot”, sharing of outturn savings)

- TO responsible for consenting and all other works until delivery (possibly with additional incentives for a solution that is not “its own”)
- Part of DO winner reward could be delayed until post-delivery, to align incentives
- Unclear on conflict resolution with the TO (e.g. if it has significant issue with the option that they are required to deliver)

Strawman #4: DO model

Assessment criteria	A.1 Amount of benefit available to gain from competition	A.2 Cost effectiveness of tender process	B.1 Incentive to participate	B.2 Value & frequency of opportunities	C.1 Simplicity and efficiency of tender	C.2 Effectiveness of tender process	D.1 Managing risk of project failure	D.2 Managing risk of changes to need
V. Early DO model (two-phase tender)								



4. Next steps

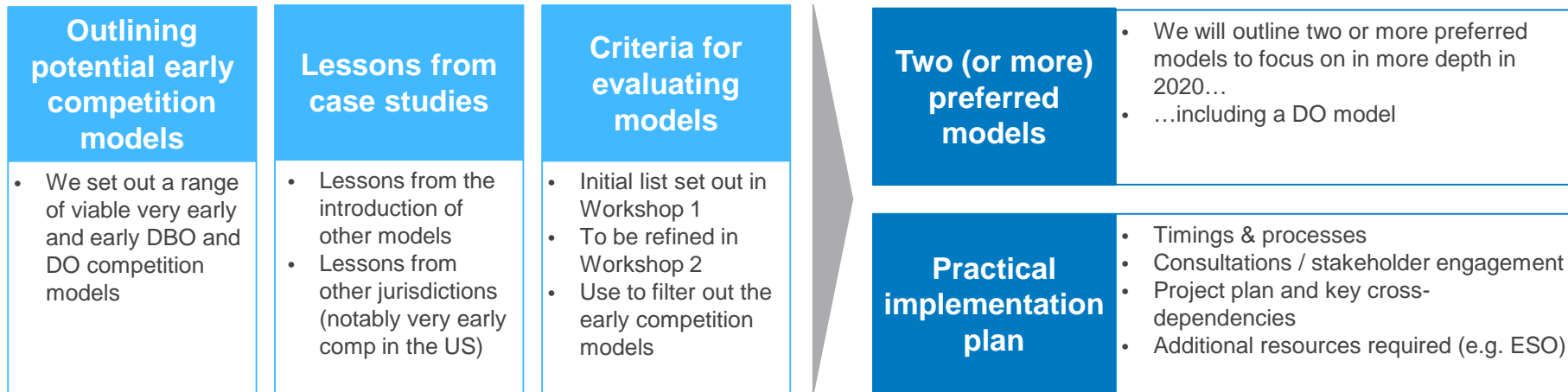


In Dec 2019 we will submit a project update to Ofgem



We are currently working on three key inputs...

...that will form the basis of our Dec update



Next steps

1. Thank you for time and effort today. We very much value your input and encourage you to send feedback after the session if you wish.
2. We will reflect on your comments from today and incorporate them in our December update.
3. Before Workshop 3, we will revisit older case studies as well as explore new ones* to inform our thinking. We would value your input on whether there are particular case studies that you think we should look at.

**Potential case studies include: NYISO, PJM, CAISO (Oakland), Ontario, Crez, Hartburg-Sabine, Fort McMurray and Western Victoria*

A1. Appendix – Additional information



Illustration: A two phase tender is valuable when new material information is expected to be uncovered

Single tender

		Y0	Y1	Y2	Y3
		Tender: single winner	Bidder understands cost better	Bidder understands cost better	Bidder understands cost better
Cost of preparation	Bid 1	£0.5m			
	Bid 2	£1m	£0.6m	£0.9m	£0.5m
Expected cost of solution	Bid 1	£20m ± £5m			
	Bid 2	£15m ± £10m	£20m ± £5m	£18m ± £2m	£20m

Tender prep = £1.5m
 Devex = £2m
 Solution = £20m
Total = £23.5

Two-phase tender

		Tender: 2 bidders shortlisted	Bidders refine bids	Bidders refine bids and design initial solution	Bidders refine bids; Final tender decision
Cost of preparation	Bid 1	£0.5m	£0.5m (duplicated cost*)	£1m (duplicated cost*)	£0.5m (duplicated cost*)
	Bid 2	£1m	£0.6m	£0.9m	£0.5m
Expected cost of solution	Bid 1	£20m ± £5m	£18m ± £3m	£16m ± £1m	£15m
	Bid 2	£15m ± £10m	£20m ± £5m	£18m ± £2m	£20m

Tender prep = £1.5m
 Devex = £2m + £2m
 Solution = £15m
Total = £20.5

Cheaper option at each year

▲ Tender ▲ Subsequent tender decision

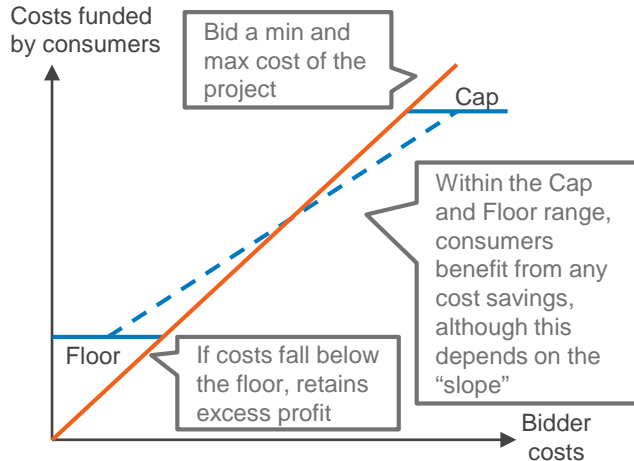
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Illustration: bid evaluation considerations

Costs metrics	Financing metrics	Options for bid flexibility	Technical metrics
<ul style="list-style-type: none"> ▪ Bid for a fixed preliminary works cost, including bidder's return ▪ Bid a 'best indicative cost' for construction and operation, including bidder's return 	<ul style="list-style-type: none"> ▪ Fixed cost of equity and gearing ▪ Indicative cost of debt and the approach to firm this up later ▪ Info and assurance on financing strategy 	<ul style="list-style-type: none"> ▪ Cap and floor – (1) ▪ Sharing factors – (2) ▪ Cost re-openers – (3) 	<ul style="list-style-type: none"> ▪ Technical capability ▪ Solution design (depending on stage) ▪ Plans for preliminary works ▪ Earliest-in-service-dates

Cap and floor – (1)

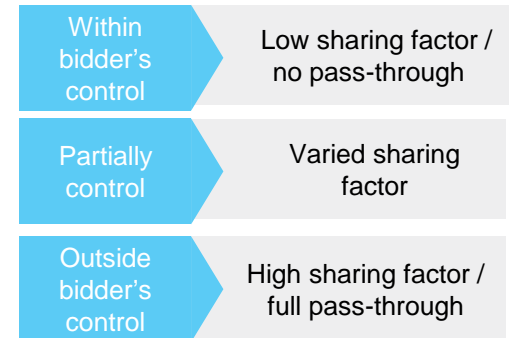


Sharing factors – (2)

Sharing factors allow alignment of incentives between developers and consumers

- Could use different sharing factors for development and construction phases
- Sharing factors could be set by bidders or the Tenderer
- Could be symmetrical or asymmetrical for cost overruns and savings

Cost re-openers – (3)

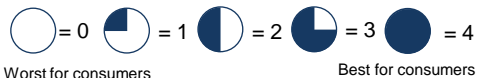


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Summary: Initial assessment of Strawman models

Assessment criteria	A.1 Amount of benefit available to gain from competition	A.2 Cost efficiency of tender process	B.1 Incentive to participate	B.2 Value & frequency of opportunities	C.1 Simplicity and efficiency of tender	C.2 Effectiveness of tender process	D.1 Managing risk of project failure	D.2 Managing risk of changes to need
DBO Early model (single tender)								
DBO V. Early model (two-phase tender)								
DBO V. Early model (single tender)								
Enhanced competition model								
DO V. Early DO model (two-phase tender)								



A2. Appendix – NOA process



The NOA has been designed to recommend investments to meet identified system requirements

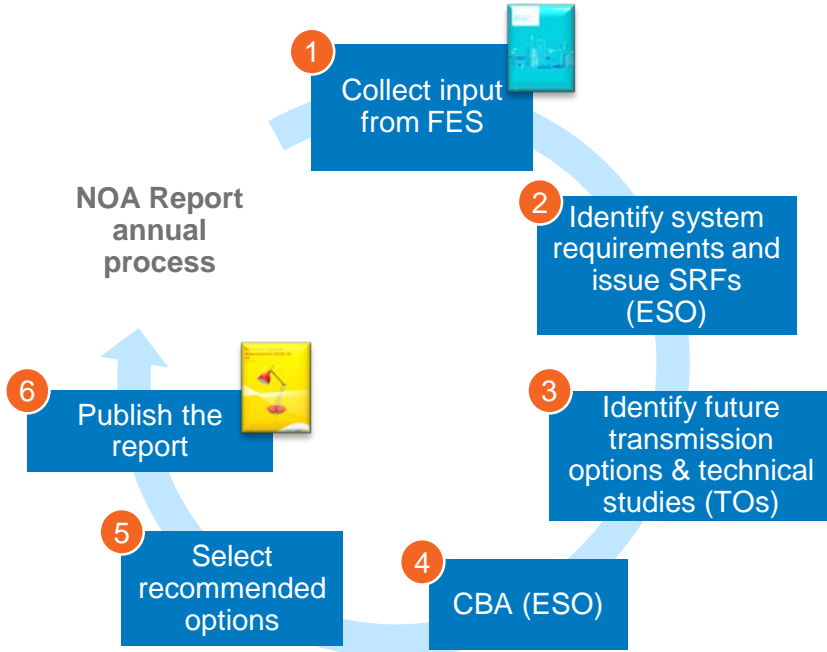
The NOA can recommend

- The **most economic reinforcements** (build or alternative solution) to meet bulk power transfer requirements as outlined in the Electricity Ten Year Statement (ETYS).
- Which investments should be made **under each Future Energy Scenario (FES)**.
- Whether the **TOs should start, continue, delay or stop reinforcement projects** to make sure they deliver the most benefit to consumers.
- The **optimum level of interconnections** to other European electricity grids, including any necessary reinforcements.

The NOA cannot

- **Insist** that reinforcement options are pursued (can only recommend)
- **Comment on specific details** of a specific project, such as how it could be planned or delivered (the TO or other relevant parties decide how to implement options)
- **Evaluate the specific design** of an option, for example the choice of equipment, route or environmental impacts (role of TO or other relevant parties)
- Assess network asset replacement projects which **do not increase network capability or individual consumer connections**
- **List all options** that the TOs develop
- **Forecast or recommend future interconnection levels** (can only indicate optimum level)

The NOA process is an annual one, iteratively reassessing the need for transmission investments



1. Inputs from FES

- NOA uses FES scenarios as the basis for studies and analysis carried out as part of the NOA.

2. Identify requirements

- For each boundary, future capability under each FES scenario and sensitivity is calculated using NETS SQSS.
- Once requirements are identified, ESO distributes SRFs to TOs.

3. Identify options & technical studies

- TOs return SRFs with credible reinforcement options for addressing a boundary need.
- TOs complete boundary capability assessment studies and submit the results as part of their SRFs. ESO performs studies of some of the same boundaries for verification.

4. Cost Benefit Analysis (CBA)

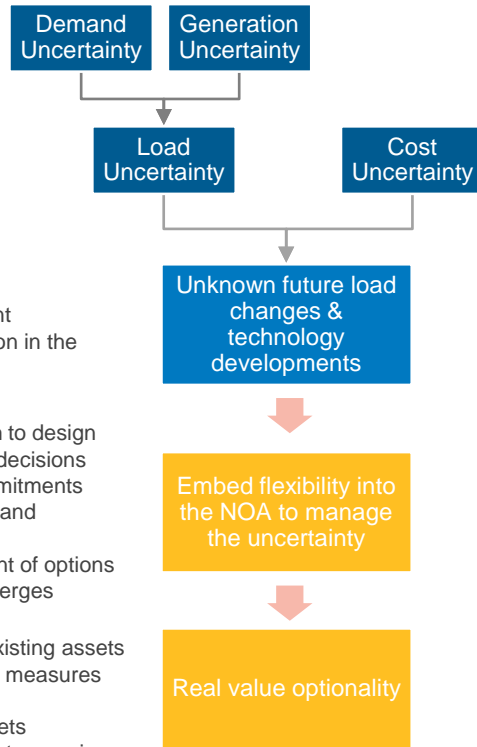
- ESO and TO agree the combinations of options that ESO will use in its CBA.

5. Select recommended options

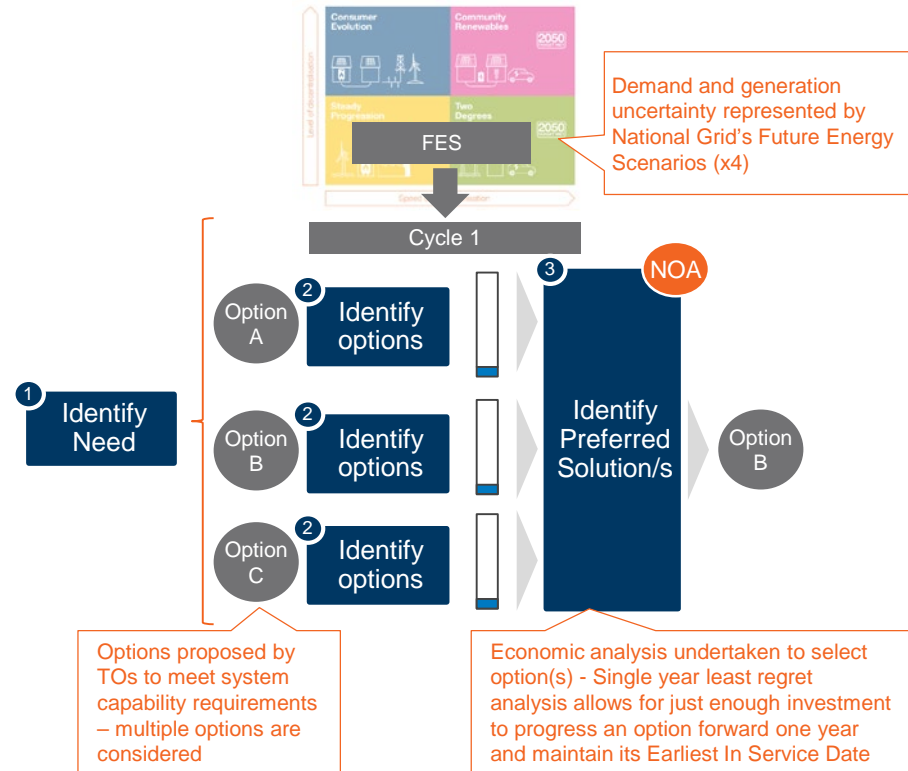
- ESO uses single-year least regret analysis to recommend a preferred solution.
- NOA Committee reviews and challenges recommendations (in particular marginal cases)

6. NOA report published

The NOA currently acts as an “optimisation engine” based on the information provided to the ESO



- Load patterns
- Technology deployment
- Cost to deliver a solution in the future
- ‘Least regret’ approach to design
- Avoid hard-to-reverse decisions
- Delay investment commitments while still meeting demand requirements
- Dynamic re-assessment of options as new information emerges
- More efficient use of existing assets and additional demand measures
- Avoided lock-in costs
- Reduced stranded assets
- New and shorter regulatory regimes



Extra: the NOA has been evolving through its Pathfinder projects

Network Development Roadmap

- This planning tool builds on the NOA and aims to drive even greater consumer benefit by:
 - Assessing system needs over the whole year to a more granular extent
 - Enabling network and commercial solutions across transmission and distribution to compete to meet transmission system needs
 - Carrying out more focused, regional assessments which consider how regional voltage issues can be more efficiently managed
 - Investigating the value and feasibility of expanding the NOA approach to system stability
 - Communicating system needs and recommendations to a wider audience in an easily understood manner

Ongoing Pathfinder Projects

- **High Voltage:** Exploring solutions for voltage management, which is becoming more difficult as the result of decarbonisation and decentralisation.
- **Probabilistic approach:** Capturing greater volatility in system flows and year-round needs.
- **System stability:** Considering the benefits and practicalities of applying NOA-type approach to operability aspects of system stability (e.g. frequency, voltage, ability to remain connected).
- **Constraint management:** Exploring introducing a commercial product to manage network constraints.
- **Post-fault constraint management:** Exploring commercial options to mitigate the consequences of unplanned events that could reduce the need for build solutions.

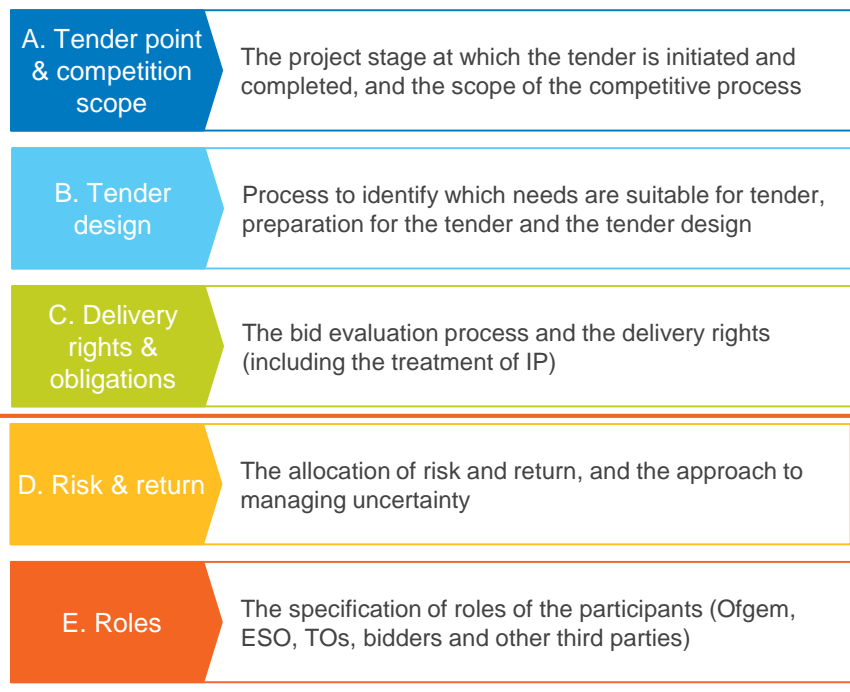
A3. Recap from Workshop 1 – Model dimensions and assessment principles



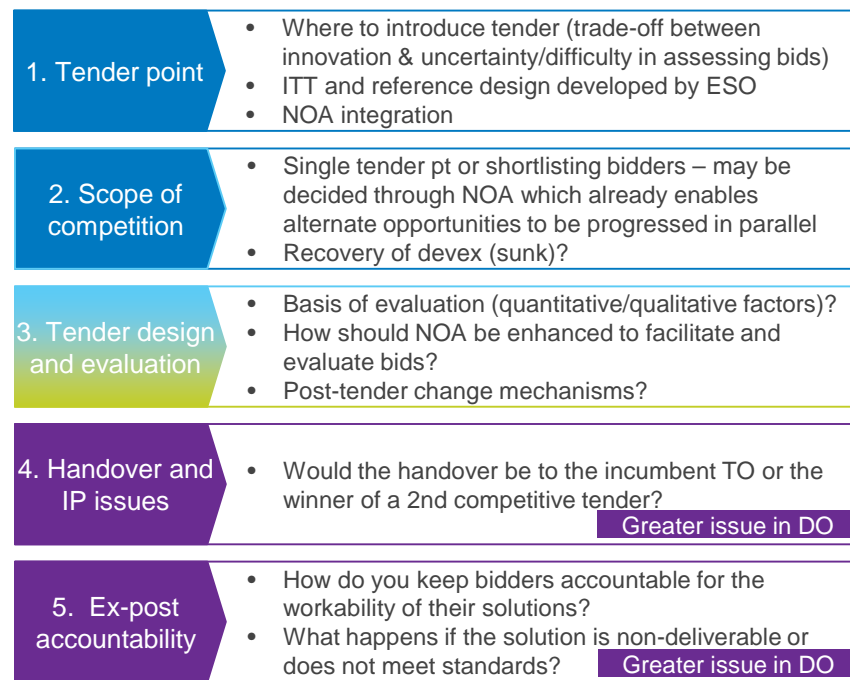
Recap from Workshop #1: Model dimensions

We have updated our five model dimensions following your feedback – we have reflected on the key considerations to articulate the specific issues and addressed any overlaps in the dimensions

Model dimensions presented at Workshop 1



Updated model dimensions to discuss in Workshop 2

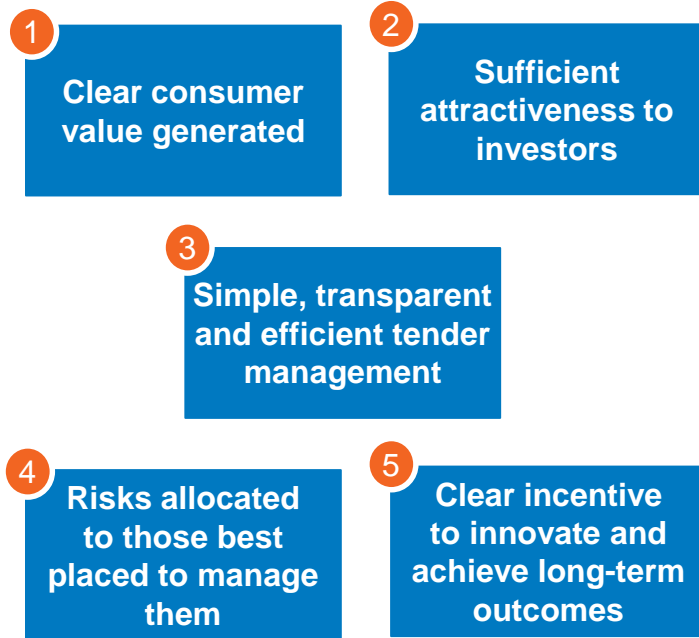


These two dimensions “cut through” each of the other dimensions

Recap from Workshop #1: model assessment principles

In Workshop 1 we discussed our thoughts on potential evaluation principles which we have now developed further based on your feedback

Initial thoughts of assessment principles from Workshop 1



Assessment criteria & objectives



