

The background features a large, stylized white arrow pointing right, overlaid on a blurred image of a modern building with a glass facade and a large, glowing, multi-layered circular structure resembling a turbine or a stylized sun. The overall color palette is light and airy, with soft blues and whites.

# **Flexibility & Capacity Working Group**

16 April 2012

## FCWG work streams

**Objective: Ensure low carbon technologies can connect in appropriate time at appropriate cost**

- DNO approach to developing business plans – scenarios and investment justification
- Outputs, incentives & uncertainty mechanisms
- Barriers to timely & cost effective connections; especially the use of non-conventional approaches

Companies will need to make use of smart grids technologies, DSR, investing ahead of need where justified against conventional investment – and consider option value when making this assessment. NO SINGLE ANSWER

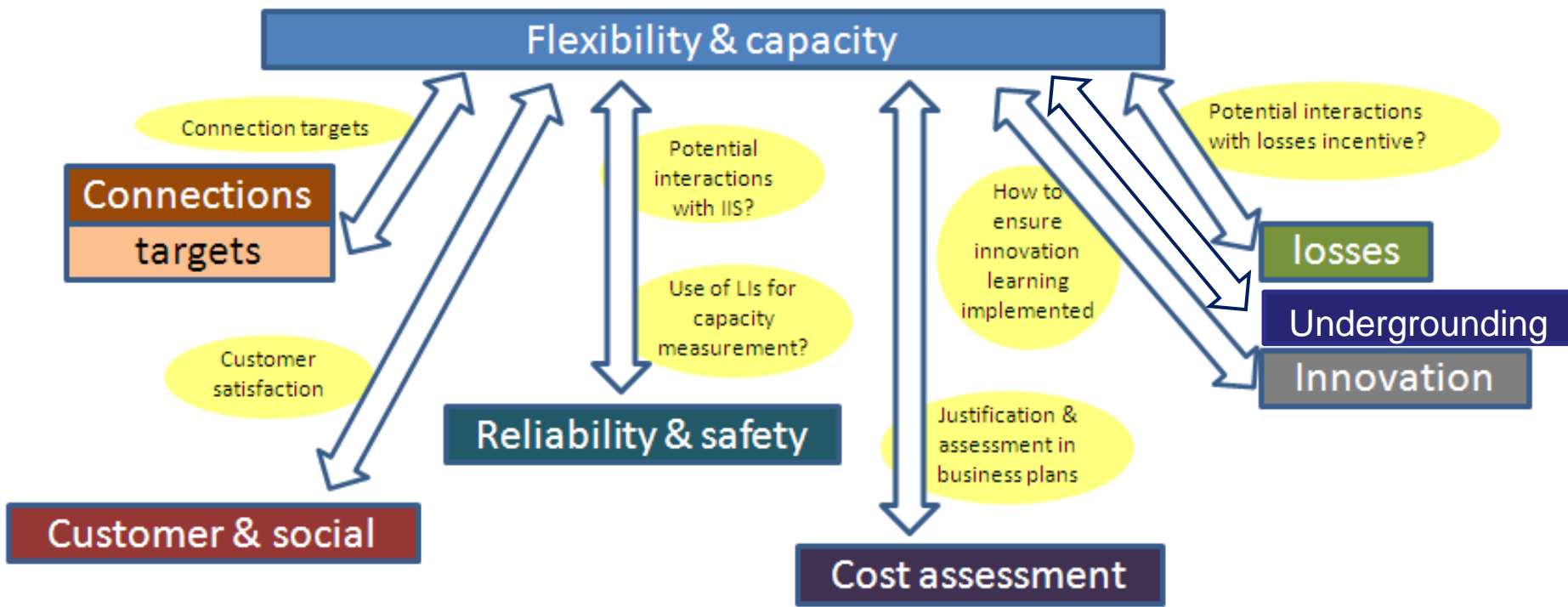
## Comparison of demands

Household average loading 400-600W; peak 15-20 kW ; ADMD 2kW (for gas/oil heating higher – but variable if electric)

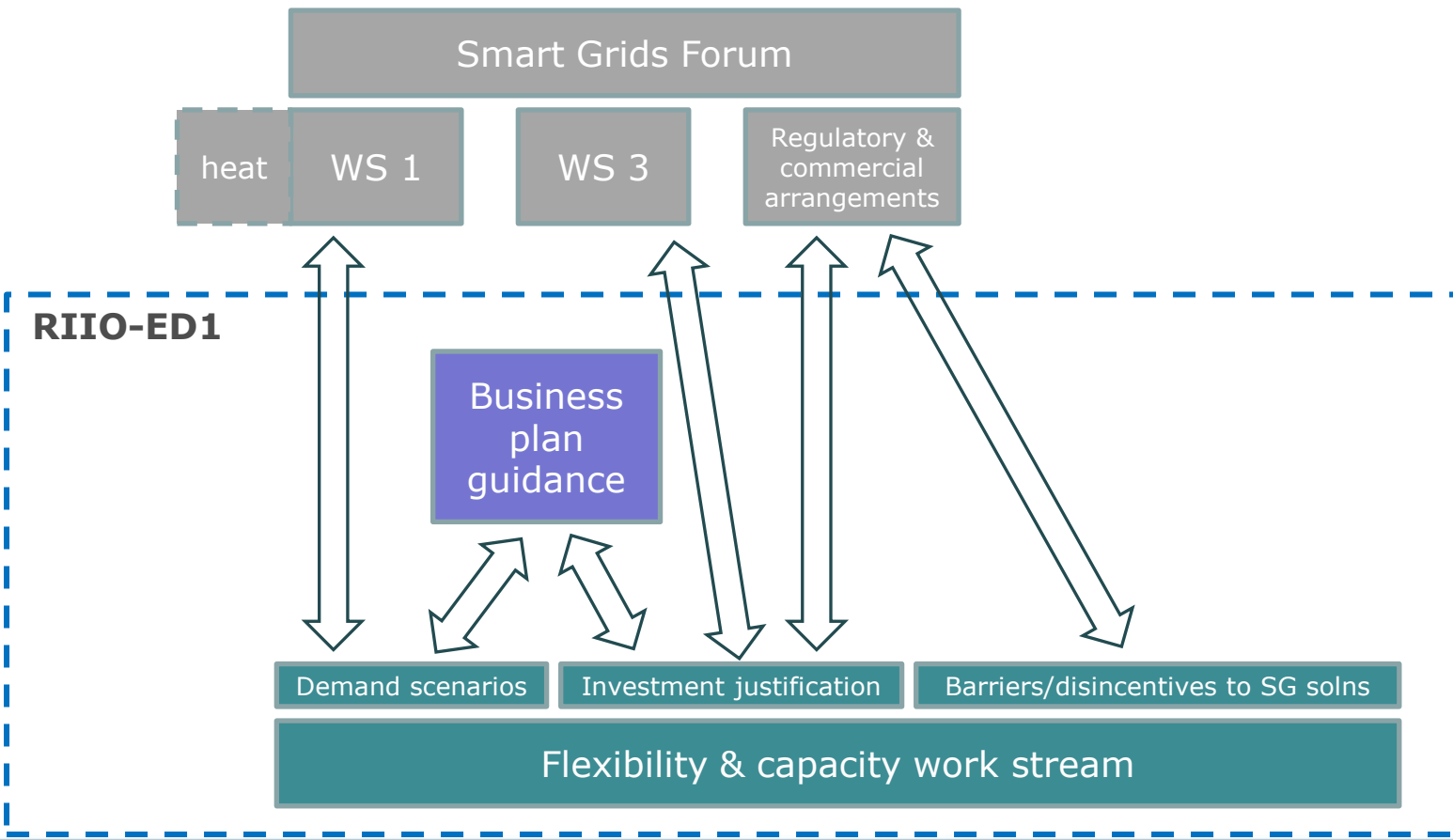
Description	kW	Risk of voltage fluctuations?	Risk of harmonics?	Loading period	Coincidence within technology?
Power shower	8-11	Yes	No	Short	Low, timings vary
Heat pump	3.5-12	Yes (if not soft start)	Yes (if soft start)	Extended	Medium to high, common usage timing
Cooker	10+	Yes	No	Short	Low, timings vary
Welder	5-10	Yes	Yes	Short	Low, timings vary
EV	3-10	Yes	Yes	Extended (likely overnight)	High
Hot tub	2-3	No	No	Extended but infrequent	Low, timings vary
Kettle	3	No	No	Short	Low
Washing machine	3	No	No	Short	Low
Toaster	2.5	No	No	Short	Low
Iron	2.5	No	No	Short	Low
Microwave	2	No	No	Short	Low
Hair dryer	1.5	No	No	Short	Low
PV	-3.68	Yes	Yes	Daytime	High coincidence with low load

**Issue not technology/low carbon but coincidence of significant demand**

# FCWG interactions: other work groups



# FCWG interactions: SGF



## Barriers/Constraints

- Barriers can't be addressed by an output/incentive, or Ofgem/DNOs changing arrangements
- We have identified the following potential barriers so far:
  - P2/6 may not allow DSR in network planning – *several DNOs working on P2/6 amendment/replacement*
  - Voltage standards can drive unnecessary reinforcement in that some modern equipment can tolerate greater voltage variability. *We cannot change EU stds.*
  - Process of grid studies for DG connection – time and cost. Potential threshold change. *Actions?*
  - EU common connection standards – *DNOs lobbying EU*
  - lead times to obtain consents and negotiate access to land for new connections - *DNOs are working with DECC on the possibility of exemptions*
  - Speculative connection requests sterilising capacity – *DNOs discussing A&D fees with DECC; suggest DNOs create plan B non-hoarding arrangements, for discussion at connections working group*

## Issues

- We have also identified the following issues which will need to be discussed at future meetings:
  - Treatment of reinforcement caused by increased demand/voltage (ie heat pump) but no change in physical connection [*to be discussed today*]
  - DSR – reliability of customer response; value to DNO versus value to customer and other entities; charging.
  - Use of storage
  - Justification of investment ahead of need
  - Impact of flexibility & capacity arrangements on competition in connections
- Some existing mechanisms may get subsumed into broader mechanisms – but only where we are satisfied it will drive the right behaviour:
  - DG incentive framework
  - DG information

## FCWG meetings

- Suggest 3 weekly - ie:
  - 16-Apr; 09-May; 30-May; 20-Jun; 11-Jul; 01-Aug
- Topics:
  - Barriers: agree list today, and actions and timings. Monitor progress (where relevant) in future meetings
  - Outputs and incentives: set out strawman in today. Expect discussions to continue through every meeting
  - Uncertainty mechanisms: towards latter part of outputs & incentives development, but part of it.
  - DSR: how much to include in the business plan, versus opportunities during price control.
    - 30 May: Update on SGF group after their 1<sup>st</sup> mtg in May –
    - 1 Aug: SGF report feedback (report out July)
  - Business plans:
    - 09-May: demand scenarios
    - 20 Jun: investment justification – after WS3 work due end of May
  - Competition in connections: whilst discussing outputs & incentives





Promoting choice and value  
for all gas and electricity customers

The background of the slide is a composite image. On the left, there are rows of solar panels under a bright sky. On the right, there is a close-up of a white ceramic water tap with water spraying out. A large, semi-transparent white arrow points from the left towards the center of the slide.

# Upstream reinforcement survey

## Survey aim

- A significant volume of new load is anticipated to come onto the distribution network in the course of ED1
- Law and regulations written before much of the new technology was developed, leading to ambiguity over how to appropriately deal with it

Survey aims to inform our understanding of DNO procedures in cases where:

- a customer has installed equipment (e.g. a heat pump or welding equipment) which has significantly increased their energy use, or altered it in such a fashion as to require upstream reinforcement for quality of supply levels on the network to be maintained.
- We are interested in cases where upstream reinforcement is required, regardless of whether or not the customer's connection also requires reinforcement.

## Size of connection

### Standard physical capacity

- Cables and fuses range between 60 and 100A ratings.
- 3 DNOs use 100A as standard, 1 uses 60A as standard, 2 vary current carrying capacity between 60-100A.

### Agreed import capacity

- Two DNOs offer a standard maximum import capacity of 15-16 kW, although this can vary depending on particular needs.
- Two DNOs do not have a standard maximum import capacity, but agree it on a customer by customer basis.
- We understand that two DNOs do not generally agree a maximum import capacity at a domestic connection point.

### Other factors

- DNOs identified the number of phases as an additional factor which impacts the size/rating of the connection .
- 3/5 DNOs noted that they install single phase cables as standard.

## Notification

### Inform demand customer

- Two DNOs use their websites to explain to customers the need to notify the DNO if there are increases to, or changes in the load. A third is currently updating their website to better explain these obligations.
- One DNO uses the Project specifications issued with quotations to inform the customer of the need to notify the DNO of any changes to their installation.
- One DNO gives an example on their website of the type of installation which may require a fuse upgrade and the process associated.

### Inform installers

- Two DNOs described their efforts to engage with installers through workshops and presentations. One also had information for installers on their website. A third has been engaging with installers on an ad hoc basis.
- Two DNOs described their interactions with installers through the ENA, with one seeking to establish a common national notification process.

## Reinforcement

### Standards

- Four DNOs explained that the extent of reinforcement works chargeable to the customer would be determined by work required to bring the area of network back within the relevant standards.

### Means of determining reinforcement

- 5 DNOs explained that they would use network modelling to determine the reinforcement necessary.

### Other solutions

- Two DNOs explicitly described the first step as an assessment of the most appropriate solution to the problem and whether alternatives to reinforcement may be appropriate.

## Charging (1/3)

Individual customer charging

- All DNOs confirmed that they charge customers on an individual basis for upstream reinforcement where appropriate.

How much?

- All DNOs confirmed that charging would be quantified through the Common Connection Charging Methodology.

Legislative and contractual provisions

- Electricity Act, 1989
- Electricity (Connection Charges) Regulations, 2002
- Distribution Licence
- Distribution Code
- Common Connection Charging Methodology Statement
- National Terms of Connection

Complaints

- DNOs reported a small number of complaints in relation to this issue .

## Charging (2/3)

### Factors determining individual charging

- DNOs confirmed that it is not possible to charge on an individual basis unless the customer causing the problem can be identified.
- One DNO explained that customers would only be charged for reinforcement where they exceeded their agreed capacity.
- Two DNOs explained that customers could be charged where they have not exceeded their agreed capacity, if an installation is having an adverse effect on quality of supply. A further two DNOs did not agree a maximum import capacity.
- All DNOs noted that the type of technology installed would not impact decisions over charging. Two DNOs described SSEG as the exception. One noted that, since under G83 customers are not obliged to notify the DNO in advance, charging is not thought to be appropriate.

## Charging (3/3)

### Factors determining individual charging

- DNOs generally agreed that the stage at which the customer has informed the DNO of the installation does not have an impact on charging, but may have an impact on the process followed.
- DNOs do not use predefined/uniform materiality thresholds on technology to determine whether to charge. Materiality is only relevant in so far as it impacts local network capacity.
- DNOs did not consider uptake of certain technologies to be 'organic' relative to others.
- Where a number of customers were felt to have contributed to the need for upstream reinforcement, there was some uncertainty of appropriate charging. Generally it was felt that the customer that tipped the balance should pay a proportion of the cost, and subsequent connectees were identified. There was less clarity over appropriate charges for previous connectees who may have contributed.
- One DNO noted that the customer may not be charged where a reinforcement scheme is already in preparation, prior to that individual customer's request.



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# **Straw man flexibility & capacity outputs discussion**

FCWG – 16 April 2012

## Timely and cost efficient connections

- Key challenges – future view of a distribution network unclear
  - DNOs will be faced with connecting unknown but increased low carbon technologies with varying impact on the network
  - Can facilitate these connections via a range of solutions e.g. conventional reinforcement, DSR, storage and investment ahead of need
- Key output objectives:
  - Customers have a connection in a timescale that meets their requirements
  - Networks are efficiently utilised - DNOs have the flexibility to respond to a range of potential future network scenarios with a range of solutions (ie from traditional reinforcement to investing ahead of need and DSR)
  - Cost of reinforcing network doesn't prohibit connections take-up
  - Low carbon technologies are not unduly disadvantaged compared to other connections because of the additional challenges they pose

These objectives potentially work against each other in driving behaviours

## Existing mechanisms under DPCR5

- **Guaranteed standards of performance (GSOP)**
  - Covers 12 key areas including connections
  - DNOs penalised if doesn't meet required standard

*Key drawbacks for ED1 incentive: one size fits all, minimum standards become performance targets, scaled to the rate of the slowest, no need to consider customer needs*

- **Broad measure of customer satisfaction (3 key elements)**
  - Customer satisfaction survey (penalty/reward)
  - Complaints metric (penalty only)
  - Stakeholder engagement (reward only)

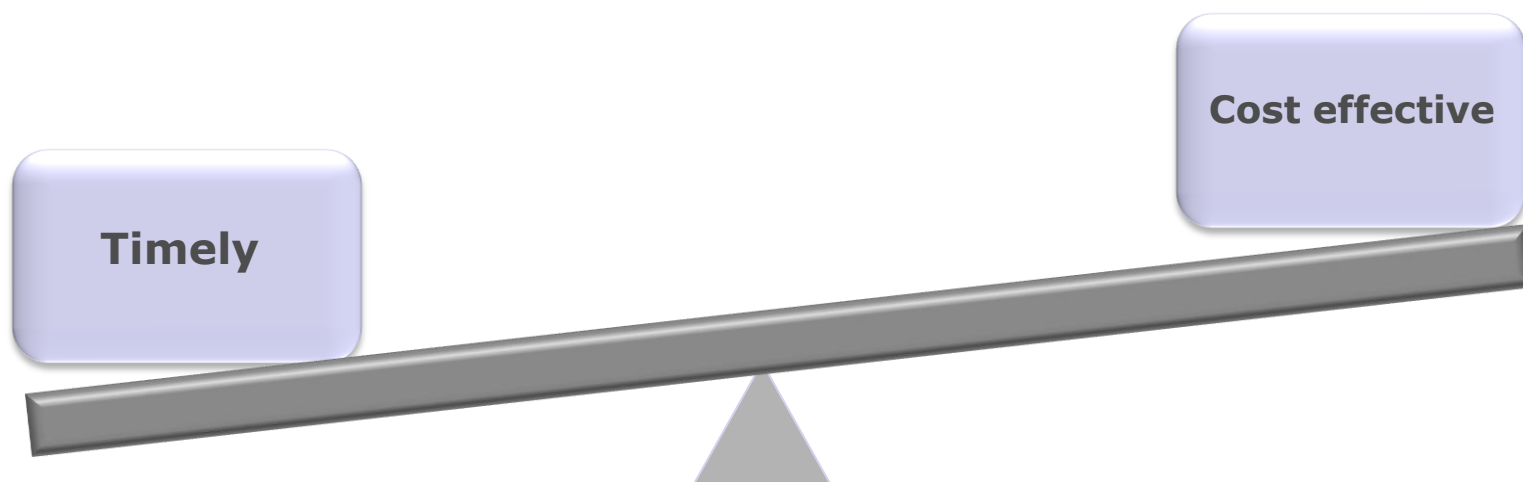
*Key drawback for ED1 incentive: Allows flexibility to tailor service to meet customer needs but difficult to attach a large incentive to small sample size for key customer groups*

Need to develop new (additional) mechanisms for ED1 as existing mechanisms wont drive the required behaviours for flexibility and capacity

## Principles

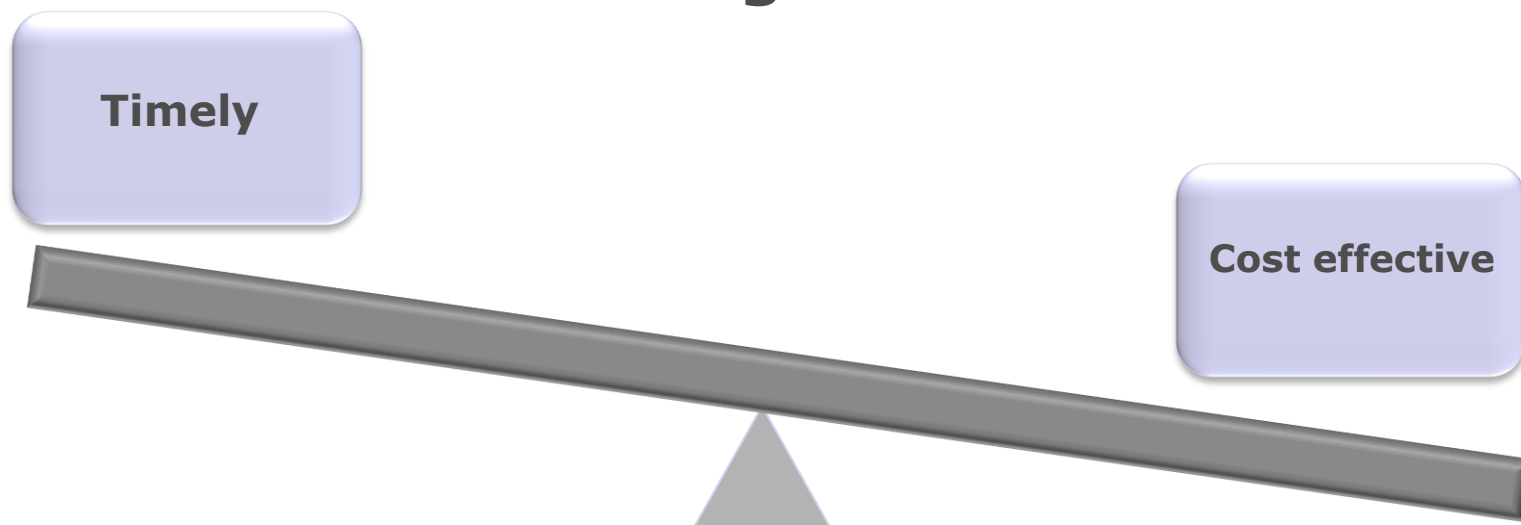
- We are creating a level playing field for all connections
- Regulatory and commercial arrangements may differ for low carbon technologies to the extent necessary to enable a level playing field
- DNOs should facilitate, and not act as a barrier to, low carbon technologies connecting (recognising they may have some unique issues)

## Balancing incentives



**If time incentive dominant, companies may install excess capacity to speed up connections – risk of white elephants and under utilised assets**

## Balancing incentives



**If cost incentive dominant, DNOs may use conventional approaches which may be slow and/or do not meet the needs of customers**

We want a framework that drives the companies to balance the time for connections and connections cost

# Straw man incentive – “Service delivery targets”

Applicability

- New and modified connections
- LV and HV

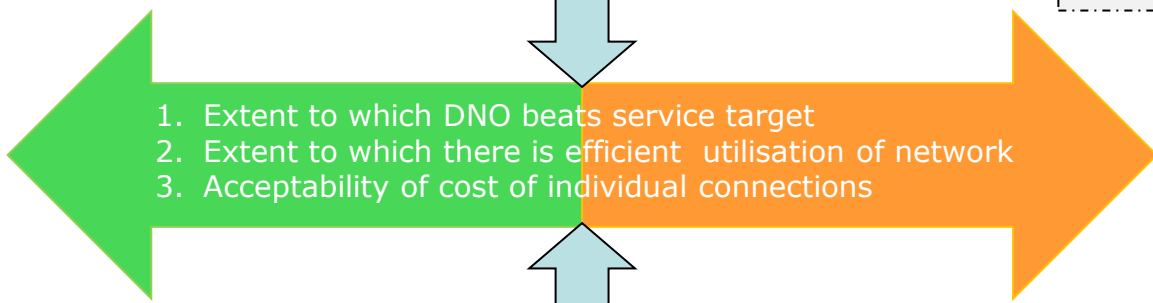
**Timely**  
**Service delivery target**

Generation LV	GSOP	DPCR5 average time	ED1 service target
Time to quote	65 days	X days	X-Y days
Time to connect	N/A	X days	X-Y days

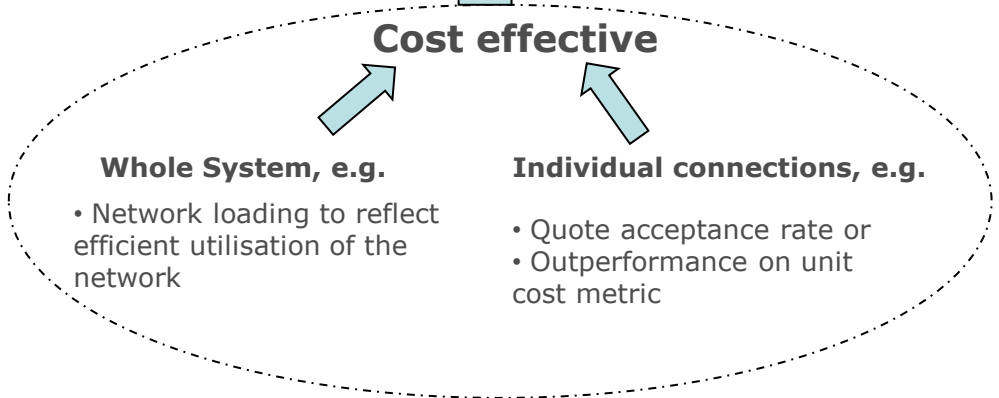
Potential options for who sets the target e.g.

- Ofgem – using DNO historic performance benchmarking
- DNOs – informed via stakeholder engagement

**Reward**



**Penalty**



Straw man incentive for discussion: range of potential options for how it could look

## Questions

- Do you agree with the proposed objectives for an ED1 low carbon connections incentive?
- Do you consider the strawman could facilitate the proposed objectives?
- What are the potential advantages of the “service delivery targets” approach?
- Do you consider there are any potential issues with the “service delivery targets” approach?
- What potential alternative mechanisms could facilitate the required objectives?



The background of the slide is a composite image. On the left, there are rows of solar panels under a bright sun. On the right, a hand is shown holding a white document. In the bottom left corner, a blue gas burner is visible. The overall theme is energy and customer service.

*ofgem*

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