Charging Futures

Reforming electricity charging together

Forum

Charging Futures Forum

23 May 2018

Welcome

Louise Schmitz, NG ESO - Lead Secretariat

Welcome

Frances Warburton, Ofgem - Forum Chair

Objectives for the day

- **Learn** about recent developments of the Targeted Charging Review, including modelling work
- **Learn** about the Settlement Reform Project
- **Learn** about the Task Forces' final report on Access rights and Forward-looking charges, and Baringa's work on the case for change
- **Ask** your questions to Ofgem and Task Force members
- **Contribute** your thoughts on all three projects, including on interactions between the three projects

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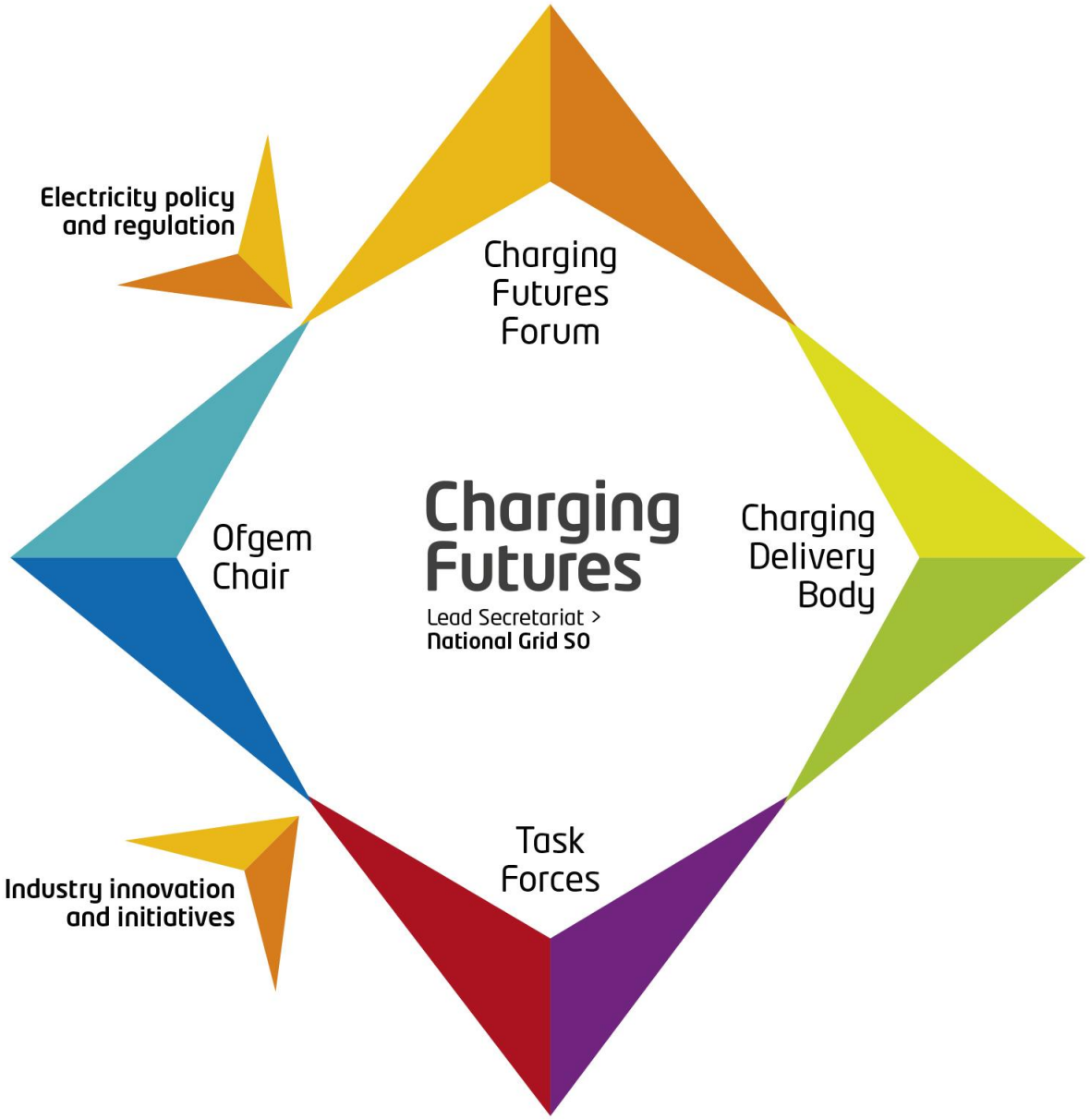
The Charging Futures ecosystem



INDUSTRY CODE GOVERNANCE

CUSC
Connection and Use of System Code (for transmission)

Code admin > **National Grid**

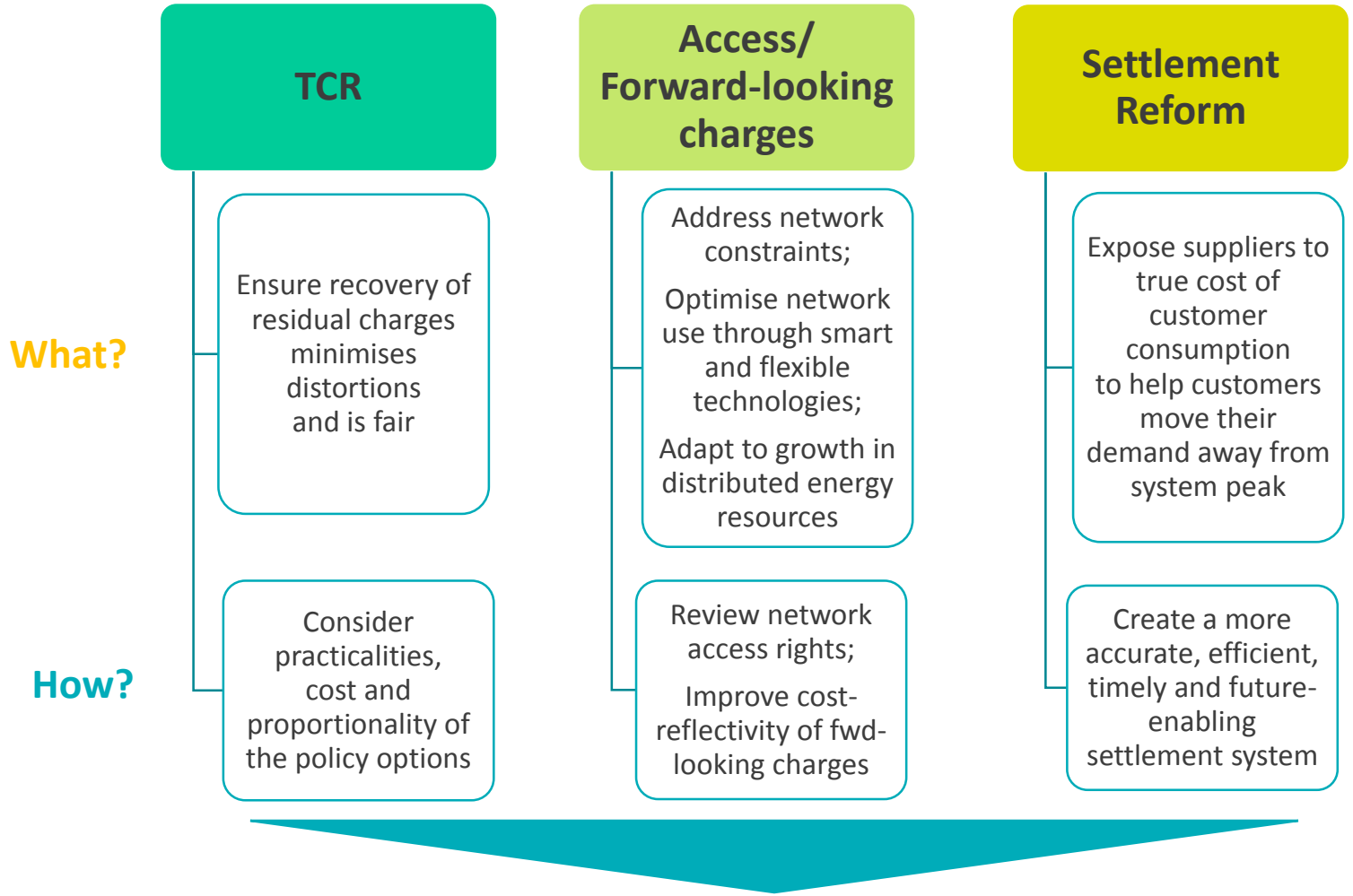
DCUSA
Distribution Connection and Use of System Agreement

Code admin > **Electralink**

BSC
Balancing and Settlement Code

Code admin > **Elexon**

TCR, Access/forward-looking charges and Settlement Reform – the overall programme



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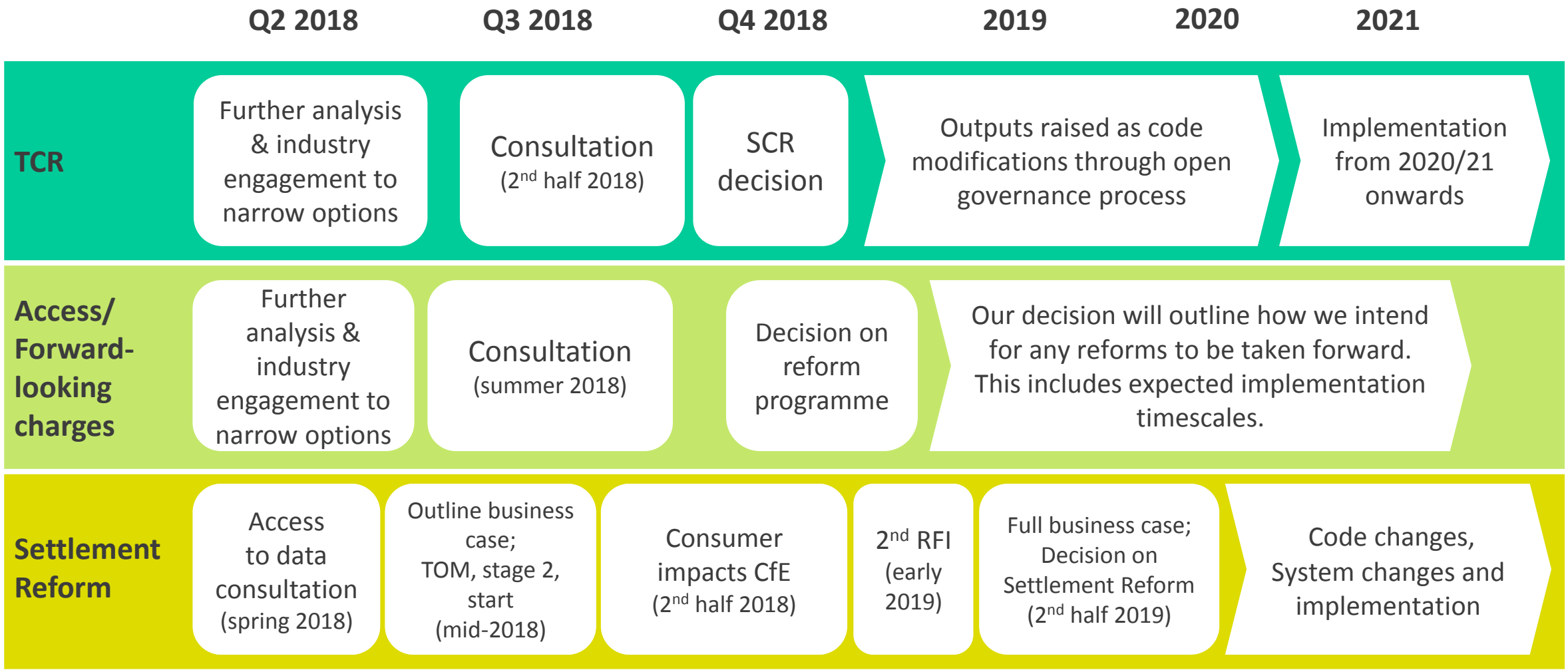
Consolidated timelines



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Agenda

- 10:00 – 10:15: **Welcome** – Frances Warburton, Ofgem
- 10:15 – 10:50: **Targeted Charging Review –** Andrew Self, Ofgem
  - The case for change
  - TCR workshop summary
  - Q&A
- 10:50 – 11:20: **Update on Frontier's analytical work**

  – Sam Street & Abbas Hussain, Frontier Economics
- **11:20 – 11:35: Coffee break & Charging drop-in desk**
- 11:35 – 11:55: TCR breakout discussions – Andrew Self, Ofgem
- 11:55 – 12:35: **Settlement Reform** **–** George Huang, Ofgem

  – Kevin Spencer, Elexon
- **12:35 – 13:25: Lunch & Charging drop-in desk**

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Agenda

- 13:25 – 13:40: **Electricity network access project** – Jon Parker, Ofgem
  - Brief overview
  - Project objectives and timelines
- 13:40 – 13:55: **Baringa analysis** – Nick Screen, Baringa
- 13:55 – 14:40: **Task Force progress & conclusions** – Task Force members
  - Overview of work since last Forum
  - Overview of conclusions
- 14:40 – 14:55: **Electricity network access project Q&A**
- **14:55 – 15:15: Coffee break & Charging drop-in desk**
- 15:15 – 16:15: **Overall programme –** Frances Warburton, Ofgem
  - Brief overview
  - Breakout discussions
- 16:15 – 16:30: C**losing remarks** – Frances Warburton, Ofgem

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Your involvement

Learn

Ask

Contribute

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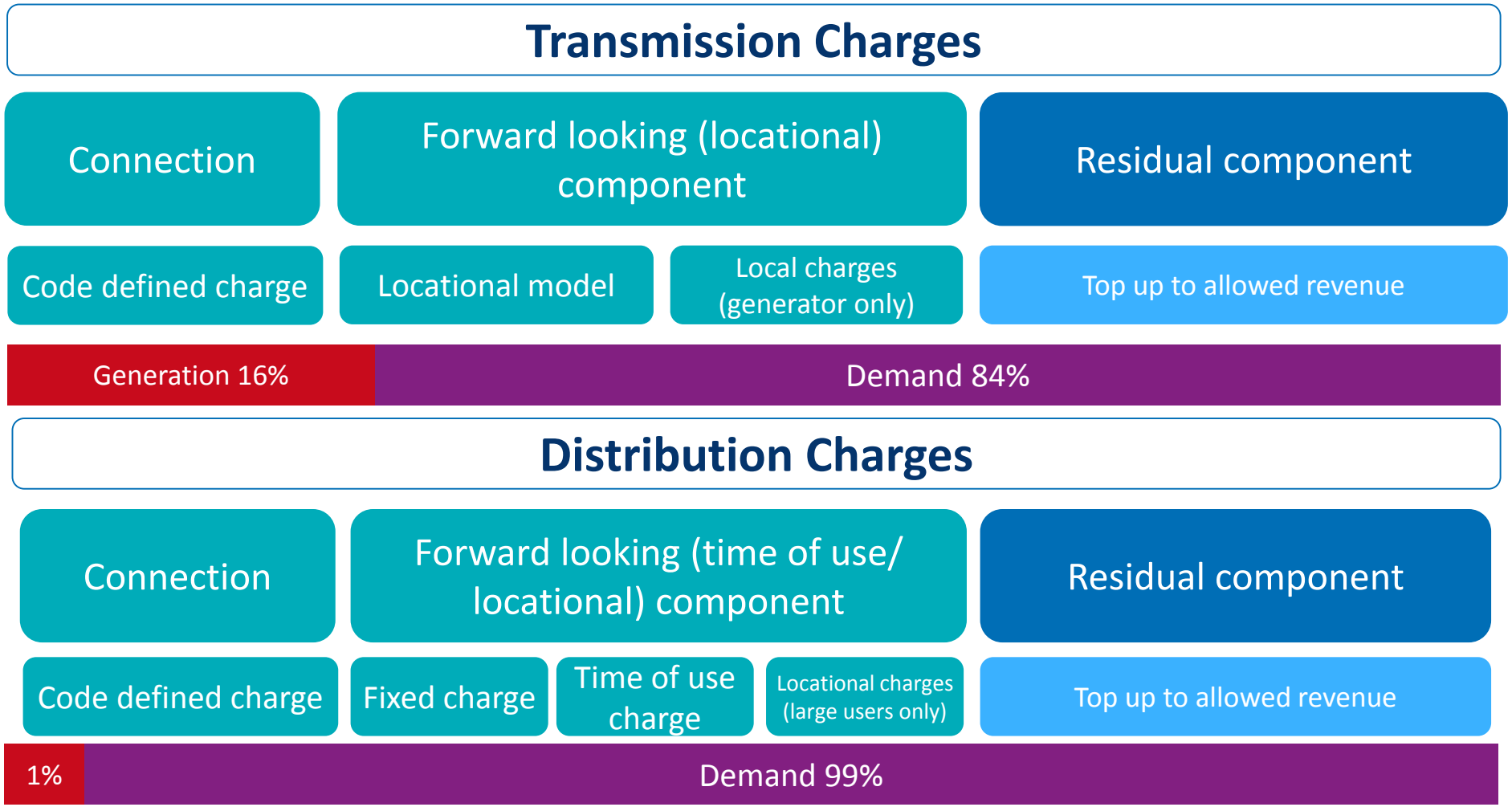
Targeted Charging Review:
The case for change

Andrew Self, Ofgem

The components: a reminder

The current levels of network and SO charges are c£10 B per year, of which about 50% is connection/ forward-looking and 50% is residual/cost recovery charges



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Why reform residual network charging framework?

We think that residual network charges should be reviewed in order to reduce harmful distortions, and so that everyone pays a fair share.

Under the current system, we believe:

- Some users may make decisions based (in part) on residual charges, and pay lower charges as a result, although their actions have **not reduced the total level of costs** which need to be recovered.
- The increase in availability and affordability of smaller scale generation means that **some consumers can more easily reduce their net demand**.
- The current way that residual charges are set creates some incentives that could lead to a **more expensive system overall**.
- Current **residual charges fall increasingly on groups of customers who are less able to take action.**

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Targeted Charging Review overview

Current framework

- Inefficient investment decisions
- Increasing system costs
- Inefficient operation decisions
- Increasing costs for inactive consumers

Significant Code Review

Targeted Charging Review (TCR)

Desired outcomes

- Resolve how residual charges are set and recovered
- Review embedded benefits

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What we said in November

Our Principles	Our work	Initial view
	Who should pay residual charges?	✓ Demand ✗ Generation
Reducing Harmful Distortions Practical Considerations	How should residual charges be recovered?	✓ Gross ✓ Fixed ✓ Ex ante ✓ Ex post ✗ Net volumetric ✗ Net import and export ✗ Peak import or export
Fairness	How should that mechanism be implemented?	? Triad ? Individual peaks ? Ratchet charges ? hybrids ? ….

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Our Analytical work

To date, we narrowed down our shortlist of options to four high level recovery mechanisms. We intend to conduct further analysis. Our work will focus on:

1) **Distributional impacts**
   I. Static analysis
   II. Behavioural response

2) **Whole systems impact**
   I. Vanilla options
   II. Detailed policy design
   III. Transitional arrangements

3) **Proportionality and practical considerations**
   I. Costs of reform
   II. Implementation timelines
   III. Impact on different industry users

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Stakeholder Workshop Feedback

- In late April we held stakeholder workshops in Glasgow and London to allow participants to feed in views on our proposed approach to the analytical work.
- The stakeholder feedback will help inform the analytical work that will support GEMA's decision on the TCR.
- Stakeholders shared many views and provided useful insights into the our proposed approach. Some of those shared views are captured below:

Support for the proposed approach to the modelling

Wider range of user groups

Clearer links between the TCR, Electricity Network Access and HHS projects.

Reminder of the reasons for the review

Challenging timelines

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Stakeholder Workshop Feedback

Support for the proposed approach to the modelling	Most participants indicated that they were supportive of the proposed way forward
Wider range of user groups	Many stakeholders thought the proposed user groups reflected a fair cross section of industry. However, there were calls for a greater range of user groups. **We have adjusted our user groups as a result**
Clearer links between the TCR, Electricity Network Access and HHS projects.	We will be discussing all three projects today. We will publish a way forward on Access ahead of our consultation on the TCR
TCR Objectives	There was call for further clarity on TCR objectives and **a reminder of the case for change**
Challenging timelines	We intend to publish our minded-to decision later in the year. This will include views on any transitional arrangements

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Next steps

- We intend to press the ‘go button’ on our modelling activities very soon
- If you have any further comments please send them to TCR@Ofgem.gov.uk

- We will be doing work over summer to progress:

  - Quantitative assessment
  - Practical considerations
  - Fairness

- This will feed into our final policy design options

- We are due to take these to GEMA in autumn, and plan to publish a minded to decision later in the year.

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Targeted Charging Review: Update on Frontier's analytical work

Sam Street & Abbas Hussain,
Frontier Economics

Targeted Charging Review

Project update to the Charging Futures Forum

23 May 2018

Contents

Purpose of the study

Ofgem has asked Frontier to support its wider analysis of the TCR options, in particular…

Distributional impacts

Impact on different types of network users under different residual collection options

Wider system impacts

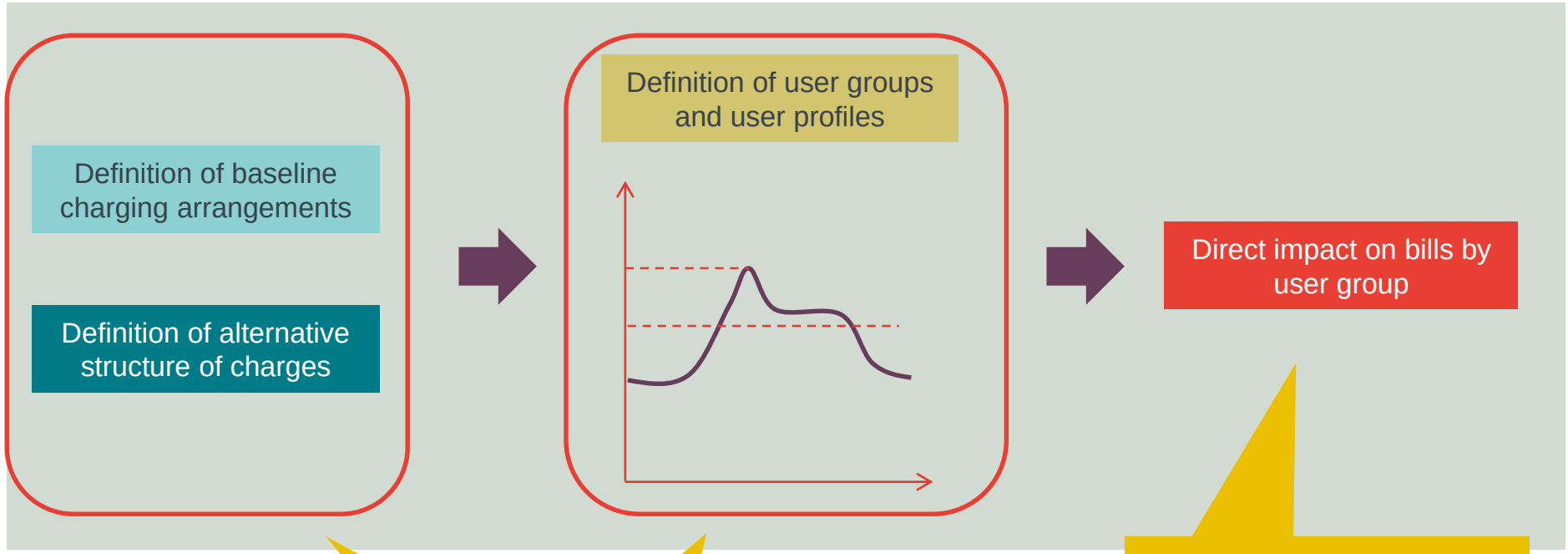
Assess aggregate market wide impacts on system and consumer costs.

This pack contains an overview of our current work/views with respect to certain aspects of this project. Some of the content will change following further consultation with Ofgem and feedback from stakeholders. Any results presented are meant to illustrate the potential impacts and do not reflect Ofgem's current policy thinking.

At a high-level there are 3 steps to the analysis

1. **Static impacts**
   - Agree a range of potential charging options and assess relative to the baseline how they affect network bills of different types of users, holding their physical behaviour constant
2. **Dynamic 'behavioural' impacts**
   - Given the potential impact on network bills for different types of users, we will consider the potential for behaviour to be affected in relation to how/when customers use the network, choose to self generate, and adopt new technologies, e.g., EV/Heat pumps
3. **System wide impacts**
   - Assess aggregate market wide impacts on system and consumer costs as a result of behaviour change, e.g., increases in demand, changes in balancing costs and investment in networks

In the first phase of the project we are aiming to understand the direct (static) impact on bills (holding physical behaviour constant)



In total we have identified 15 final demand user groups spread across domestic, commercial and industrial categories

The user groups have been updated following feedback from stakeholders and further discussions with Ofgem

Final demand

A Domestic

Size and meter type
- Low consumption 1
- Medium consumption 2
- High consumption 3
- High Economy 7 4

Appliances/onsite generation
- Solar PV/storage 5
- Electric Vehicles 6
- Heat pumps 7

B Commercial / Light Industrial
- Low consumption 8
- High consumption with solar PV/storage 9
- High consumption without solar PV/storage 10
- Light industrial HV-Connected 11

C Industrial
- EHV-Connected without onsite generation/demand management 12
- EHV-Connected with onsite generation/demand management 13
- T-Connected with peak generation/demand management 14
- T-Connected without onsite generation/demand management 15

In reality the boundaries between users may overlap. For example, small Commercial profiles will also be captured by our analysis of the larger domestic profiles

DRAFT – WORK-IN PROGRESS

Information provided by industrial stakeholders has helped inform our industrial user groups

	Features of industrial load profiles described to us	Archetypes
1	Industrial loads across T, EHV and HV network	We now have industrial user groups at each voltage level, and will test impact of excess connection capacity on charges.
2	Connection capacities do not always relate closely to actual peak demand	
3	Load without onsite generation and can't avoid triad	We will consider load without onsite generation/demand management capability on EHV and T network [Profile assumes triad peak and individual peak the same]
4	Load without onsite generation and can't avoid triad, but significant spare connection capacity	
5	Load with demand management capability and can avoid triad	Load with baseload onsite generation/demand management on EHV and T network. [Profile assumes low triad peak but high individual peak]
6	Loads based on batched processes capable of avoiding consumption during triad	
7	Loads with peaking generation and can avoid triad	
8	Loads with onsite baseload generation with: ▪ Low/zero net import with high import capacity to cover outages and maintenance ▪ Net exporting connection with high import capacity to cover outages and maintenance	

DRAFT – WORK-IN PROGRESS

Update on bill impact analysis

Qualitative

- Our initial work has focused on a qualitative assessment of the impacts on different types of users
- This supports understanding of the quantitative impacts and helps to draw out more general points around the dynamics of expected impacts

Quantitative

- We have developed the bill impact model across each of the charging methodologies (i.e., CDCM, EDCM, TNUoS).
- We do not yet have sufficient data to calculate the charges for each of the methodologies, however, we have requested further data from the industry.
- Our initial analysis has focused on CDCM charges, some of which we present today.

In the following section, we set out our understanding of the baseline charges, and then consider qualitatively the impact of each of the 'vanilla' charging options separately. Where relevant we provide illustrative CDCM bills analysis for different user groups

Residual cost recovery arrangements vary across the three residual charging methodologies

Charging arrangements for residual cost recovery under status quo ("baseline")

TNUoS

- Half-hourly metered users charged on the basis of "triad" - £/kW based on user's peak
- Non-half-hourly metered users – charged on the basis of consumption during 16:00 - 19.00 every day (p/kWh)

DUoS

CDCM

- A "volumetric" p/kWh charge constant across all users based on net (at meter) annual consumption.

EDCM

- Customer specific residual charge charged on connection (p/kVA/day). Variation in part driven by historic net consumption usage of connection capacity during 'super-red' hours

Even though the options are to be applied consistently across each charging methodology, given the baseline varies in each, the impacts will also vary by charging methodology

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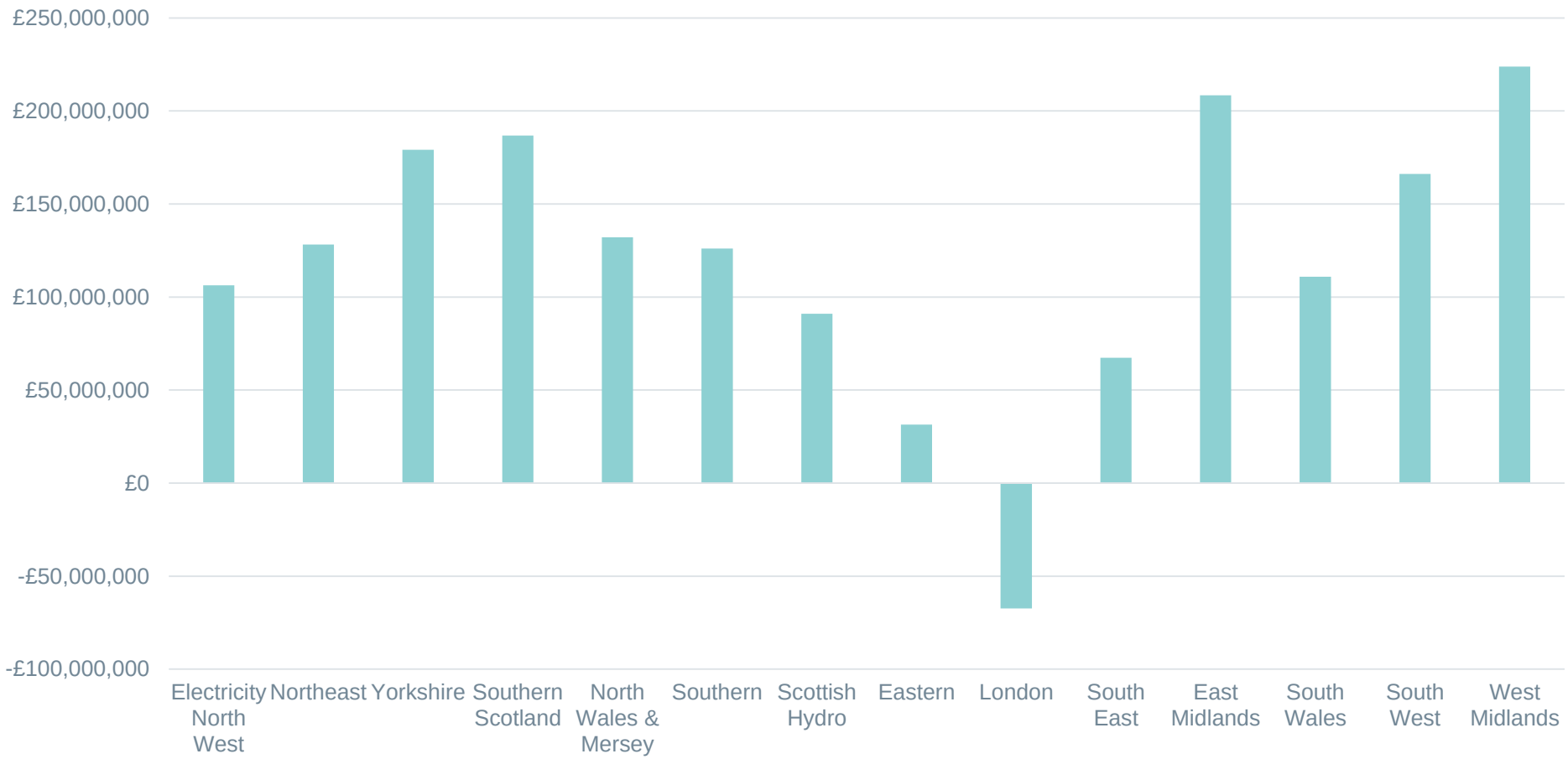
The total residual to recover varies widely across the different DNOs



There is a wide distribution of DNO fixed adders. To illustrate the impacts we use the Northeast as a ‘representative DNO’

Relative to the baseline we assess the impact of moving to each of the four alternative 'vanilla' charging options

1

Fixed

(per user fixed charges)

- As a starting point we consider the impact of options where the revenue raised from a particular segment is similar to historic levels.

2

Gross volumetric consumption *(based on all user's consumption incl. from onsite generation)*

- Apply to non-domestic customers (i.e. industrial final demands and larger commercial sites) which includes sites on the HV network under the CDCM regime.

3

Ex ante capacity *(charge related to user's agreed or connected capacity)*

- Capacity charge based on individual customer connection capacity
- We assume the same connection capacity for all domestic customers

4

Ex post capacity *(based on measure of individual peak system usage)*

- We consider the impact of a measure of single individual user peak demand

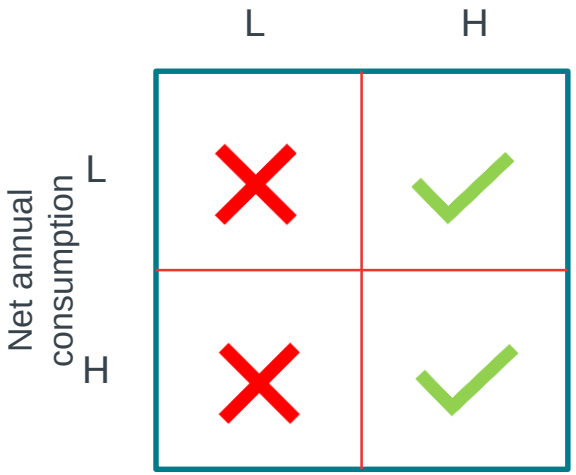
- The impacts set out in this section are 'static' i.e. they do not consider behaviour change.
- The options we consider are illustrative examples only and not indicative of final policy options

DRAFT – WORK-IN PROGRESS

Distributional impact matrices: Fixed charges

TNUoS

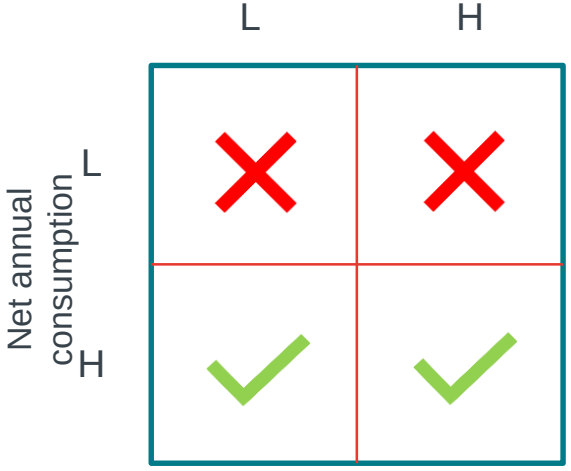
Triad/4-7pm peaks



Users with above average peaks gain, and those with below average peaks are worse off

CDCM

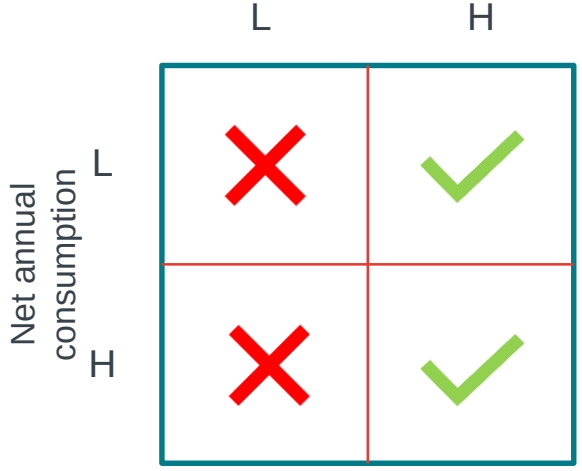
Peak demand



Users with above average net annual consumption gain, and those with below average annual consumption are worse off

EDCM

Level of current EDCM residual charge



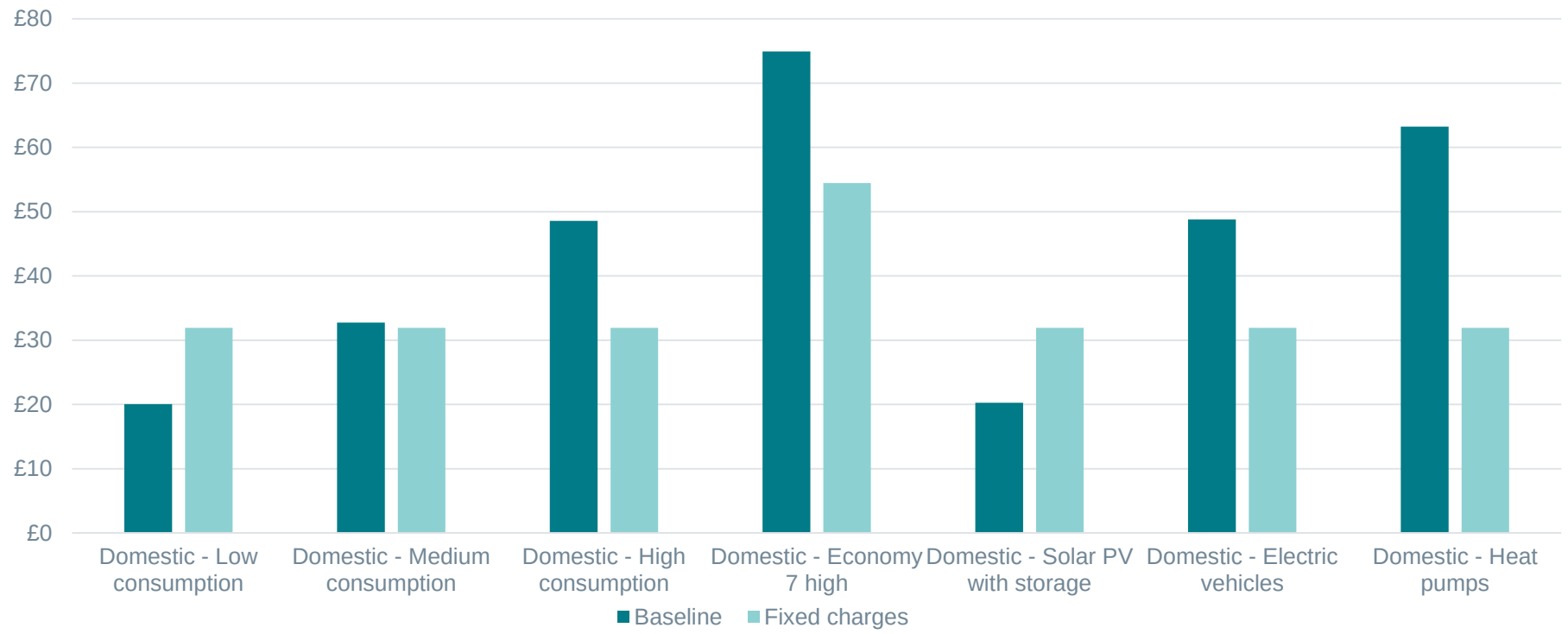
Users who previously paid high site specific EDCM charges (i.e. in part due to high historic super-red consumption as % of connection capacity) will gain.

✓ Expected reduction in residual bill

✗ Expected increase in residual bill

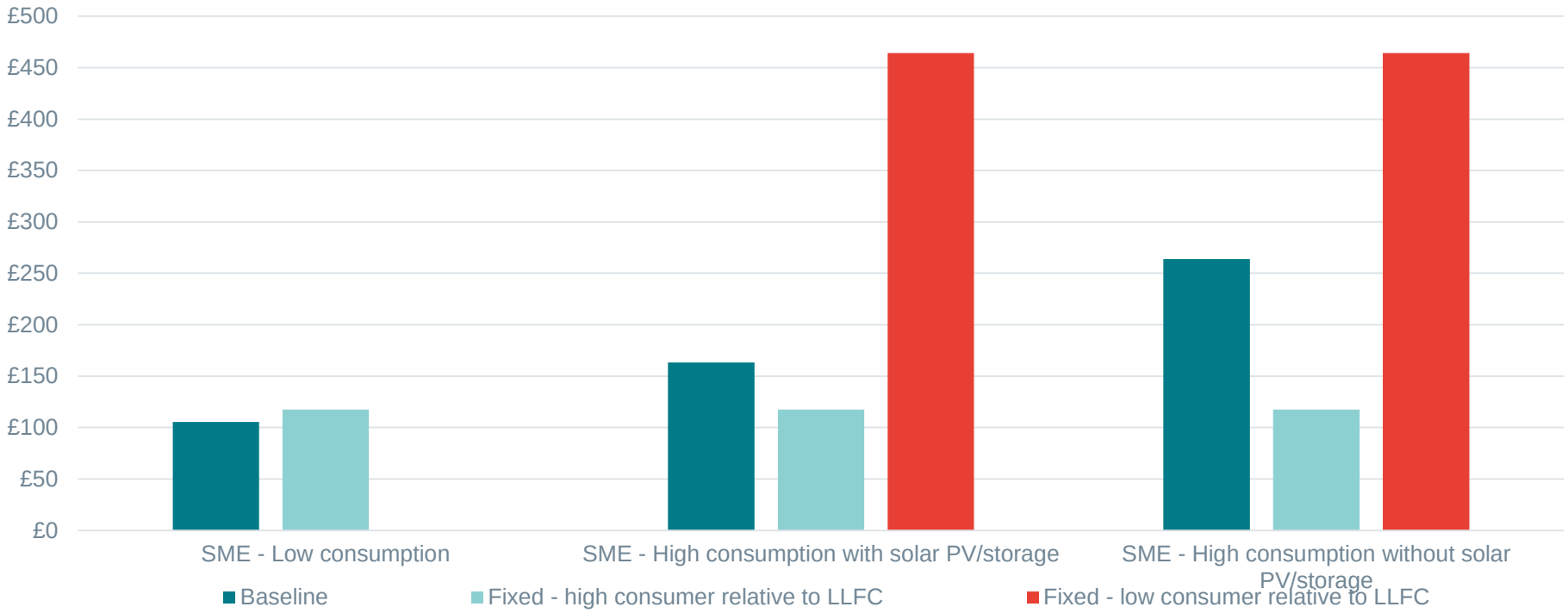
✓ Expected reduction in residual due to expansion of charging base/reduced avoidance behaviour only

Domestic user groups – fixed charge bill impact



- Results are driven by the particular approach/assumptions adopted and are meant as an illustration of potential drivers of impact.
- The total residual recovered from each line loss factor class is divided by the number of customers in that class, leading to one charge per LLFC.
- This information is provided in each CDCM model.

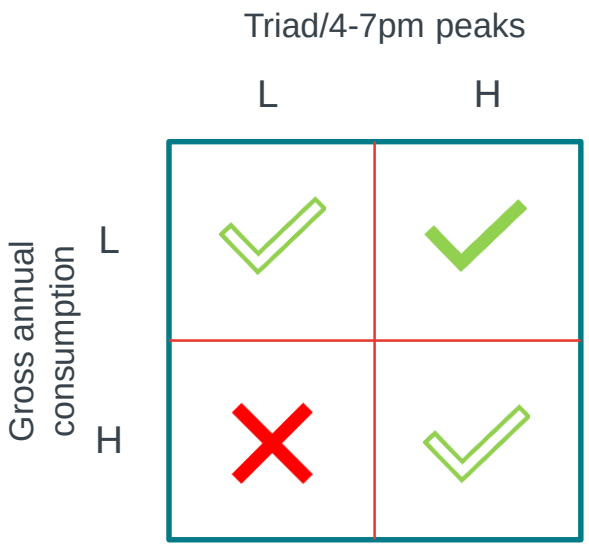
Commercial user groups – fixed charge bill impact



- Results are driven by the particular approach/assumptions adopted and are meant as an illustration of potential drivers of impact.
- The total residual recovered from each line loss factor class is divided by the number of customers in that class, leading to one charge per LLFC. As such, results are sensitive to the choice of LLFC.
- This information is provided in each CDCM model.

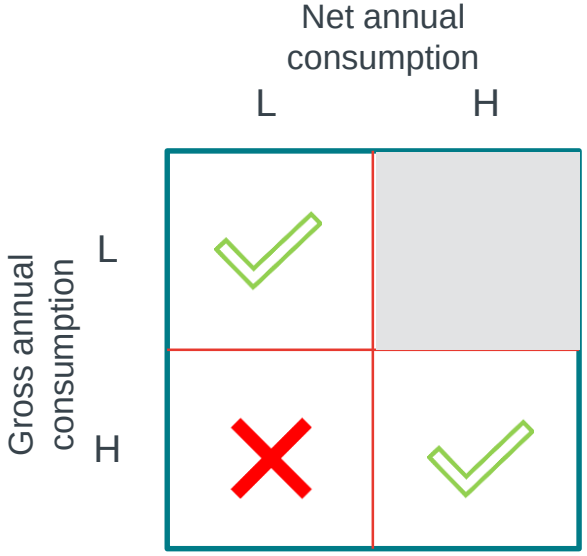
Distributional impact matrices: Gross volumetric

TNUoS



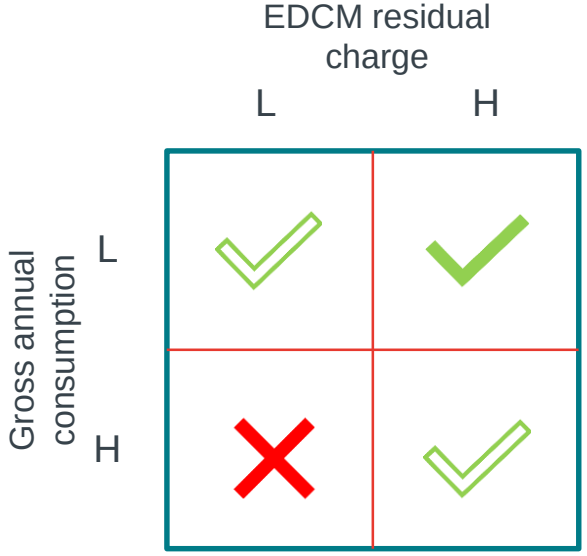
Users with “peaky” profiles gain, and those with high consumption but with low peak (incl. due to onsite generation/DSR) are worse off. Users with high charges before and after change still benefit due to expansion of charging base.

CDCM



Users with low net annual consumption but high gross consumption due to baseload onsite generation are worse off. Users with high charges before and after change benefit due to expansion of charging base.

EDCM



Users who previously paid high site specific EDCM charges (i.e. in part due to high historic super-red consumption as % of connection capacity) will gain. Users with high charges before and after change benefit due to expansion of charging base.

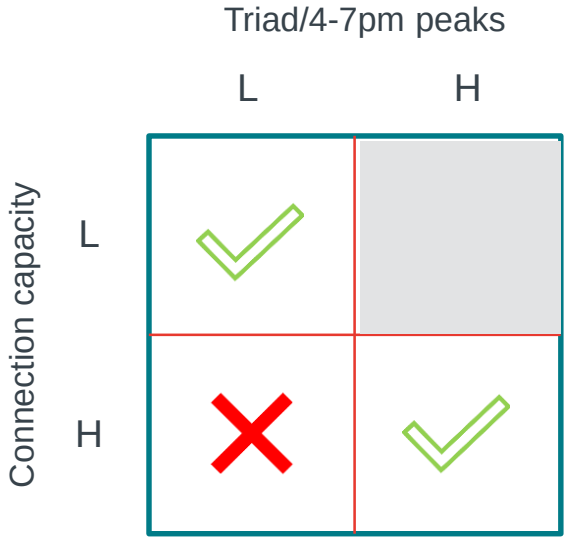
Expected reduction in residual bill

Expected increase in residual bill

Expected reduction in residual due to expansion of charging base/reduced avoidance behaviour only

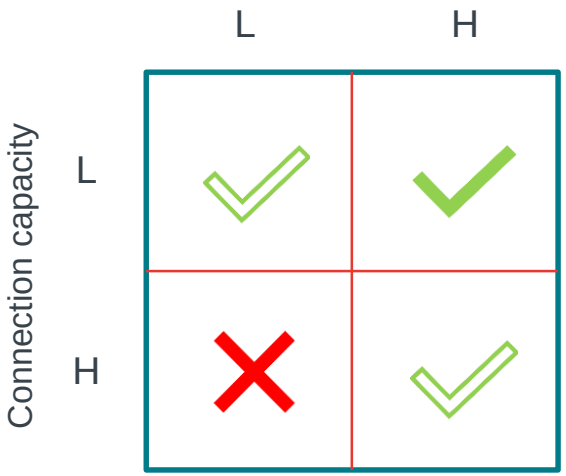
Distributional impact matrices: Ex ante capacity

TNUoS



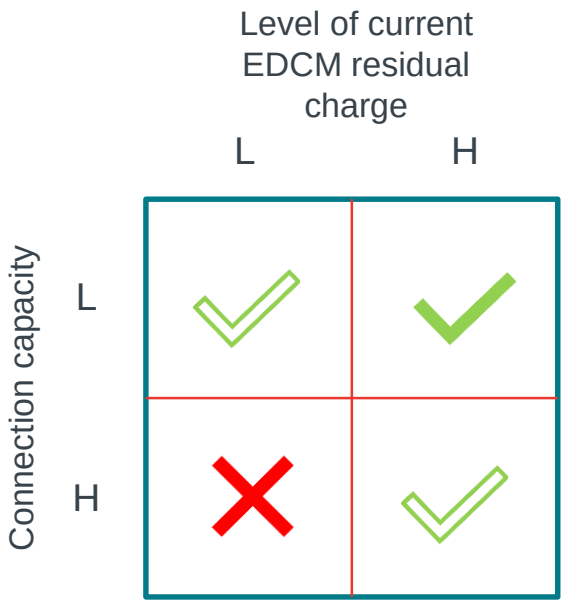
Users with high connection capacity relative to their triad peak demand are worse off. Users with high charges before and after change benefit due to reduced avoidance behaviour.

CDCM



Users with high connection capacity relative to their net annual consumption are worse off. Users with high annual consumption, fully utilising their connection capacity gain. Users with high charges before and after change still benefit due to reduced avoidance behaviour.

EDCM



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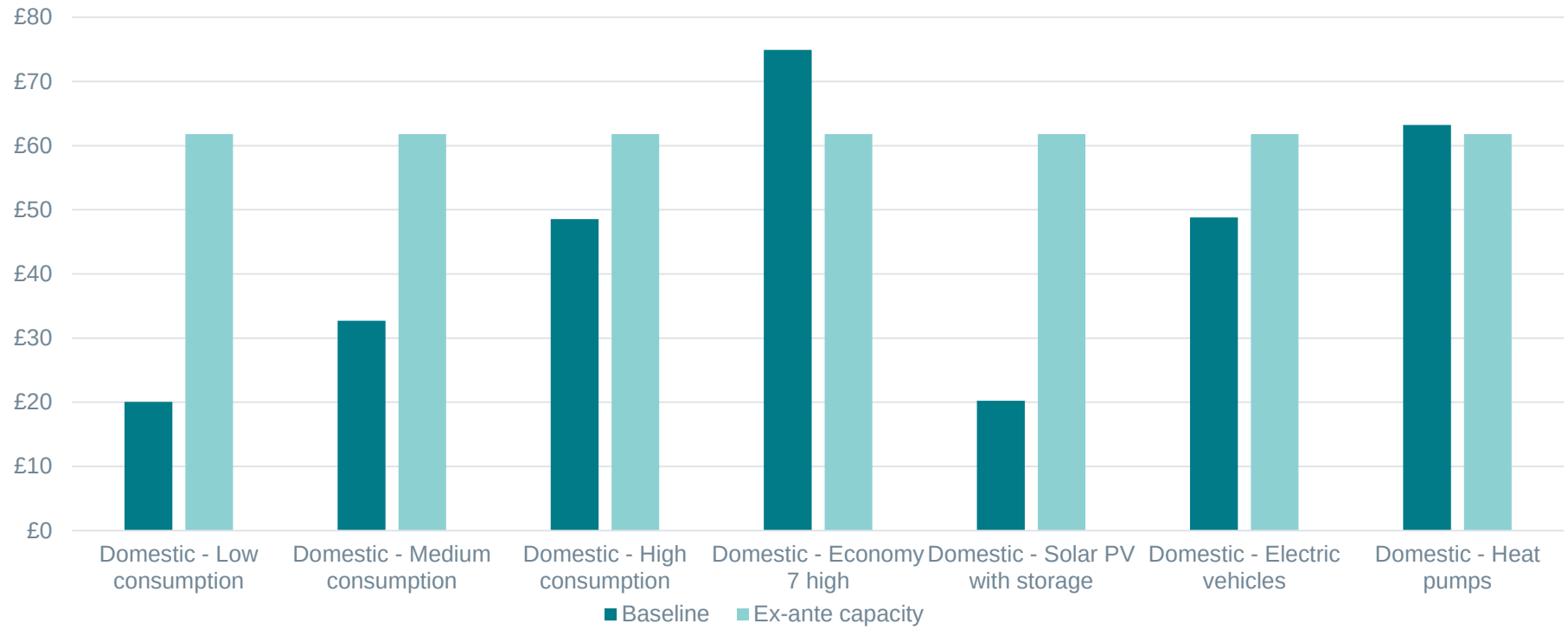
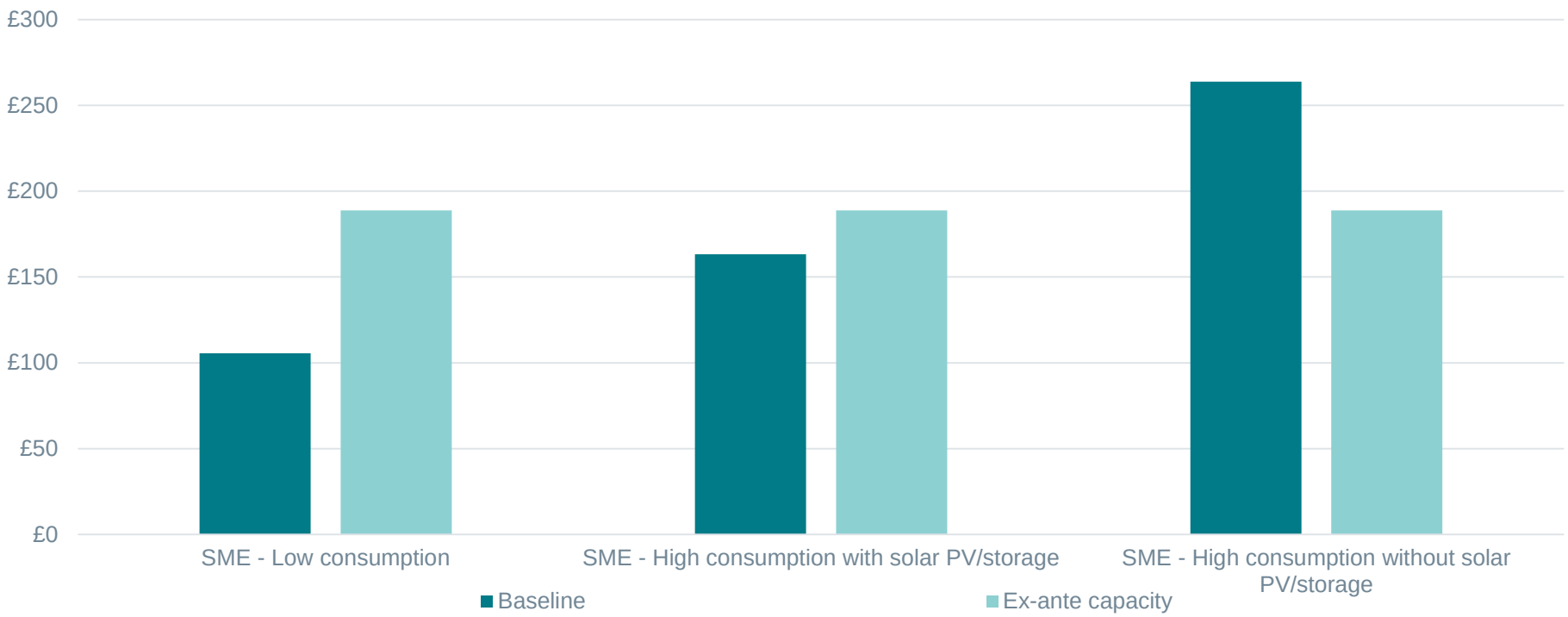
Domestic user groups – ex-ante capacity charge bill impact



- Results are driven by the particular approach/assumptions adopted and are meant as an illustration of potential drivers of impact.
- The total residual recovered within each DNO is divided by the assumed total connection capacity of DNO customers.
  - We have used connection capacities available in the CDCM models for HH customers.
  - Otherwise, we have made assumptions based on conversations with DNOs.

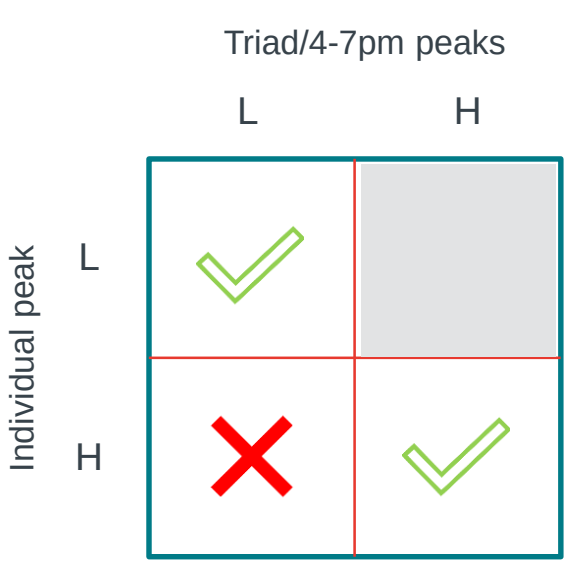
Commercial user groups – ex-ante capacity charge bill impact



- Results are driven by the particular approach/assumptions adopted and are meant as an illustration of potential drivers of impact.
- The total residual recovered within each DNO is divided by the assumed total connection capacity of DNO customers.
  - We have used connection capacities available in the CDCM models for HH customers.
  - Otherwise, we have made assumptions based on conversations with DNOs.

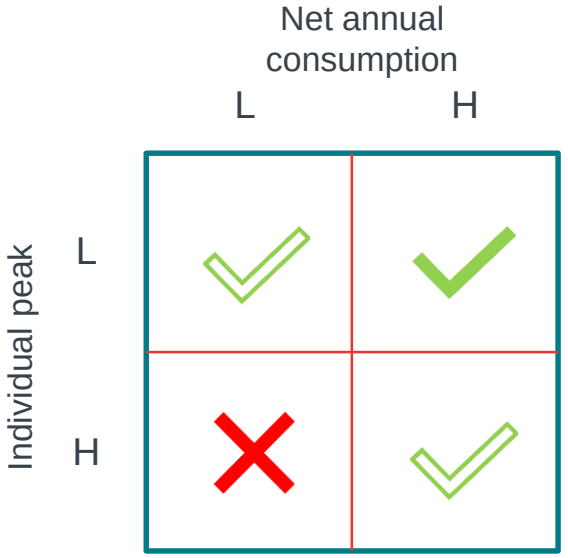
Distributional impact matrices: Ex post capacity

TNUoS



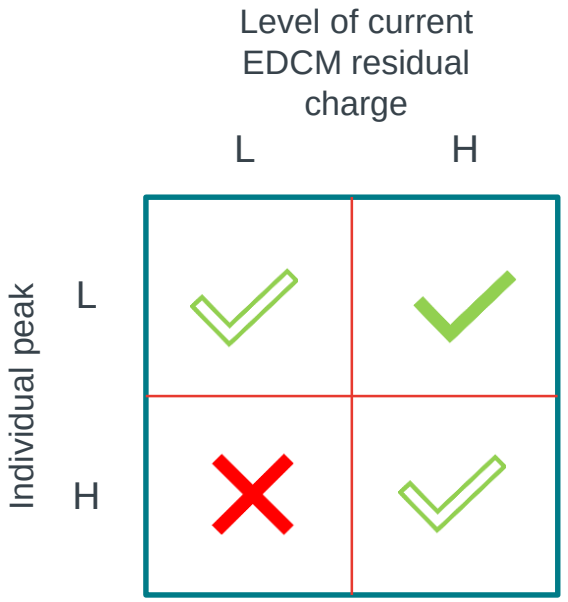
Users with high individual peak not aligned with system peak are worse off. Users with high/low charges before and after change benefit due to expansion of the charging base.

CDCM



Users with “peaky” profile are worse off relative to flat profiles. Users with high/low charges before and after change benefit due to reduced avoidance behaviour.

EDCM



Users who previously paid low site specific EDCM charges (i.e. in part due to high historic super-red consumption as % of connection capacity) but have high individual peaks are worse off (e.g. site with onsite generation but with maintenance periods resulting in high individual peak).

✓ Expected reduction in residual bill

✗ Expected increase in residual bill

✓ Expected reduction in residual due to expansion of charging base/reduced avoidance behaviour only

Charging Futures
Reforming electricity charging together

Forum

Coffee break

11:20 – 11:35

Targeted Charging Review:
Breakout discussions

Andrew Self, Ofgem

Questions to consider

- Frontier's analytical work will be published with our Impact Assessment.

  Do you feel this type of material will help you understand the implications of the final set of residual charging options for you or your business?

  What could be done to improve the information set?

- Given the initial views on distribution impacts, what should this mean for the final policy options, and potential hybrid approaches?

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Settlement Reform Project

George Huang, Ofgem

Kevin Spencer, Elexon

ofgem Making a positive difference for energy consumers

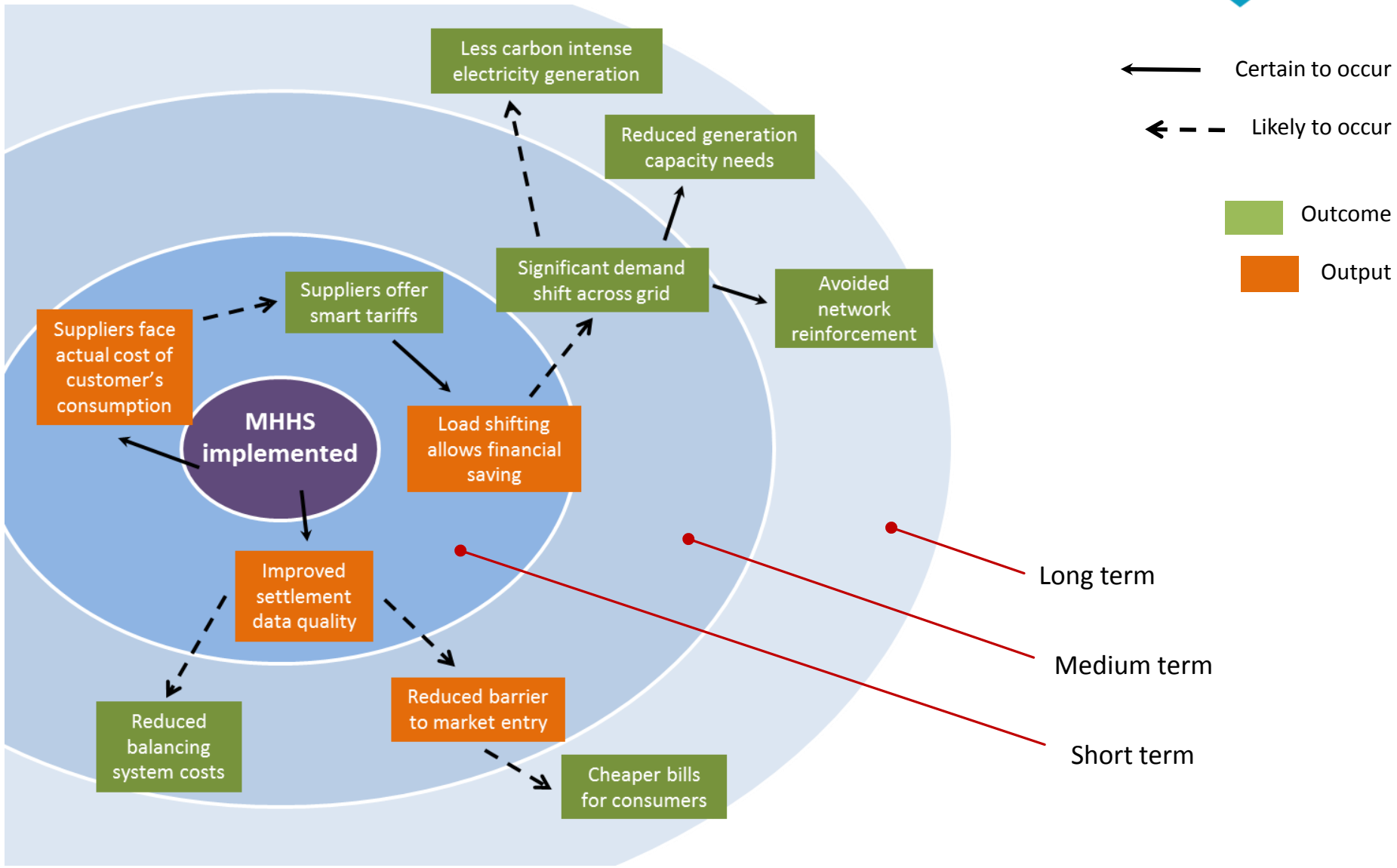
Update on Market-Wide Settlement Reform SCR

George Huang
Kevin Spencer
23 May 2018

What we'll cover

- Project overview
- Business Case
- Consumers and Policy
- Target Operating Model
- How to get in touch with the Settlement Reform team

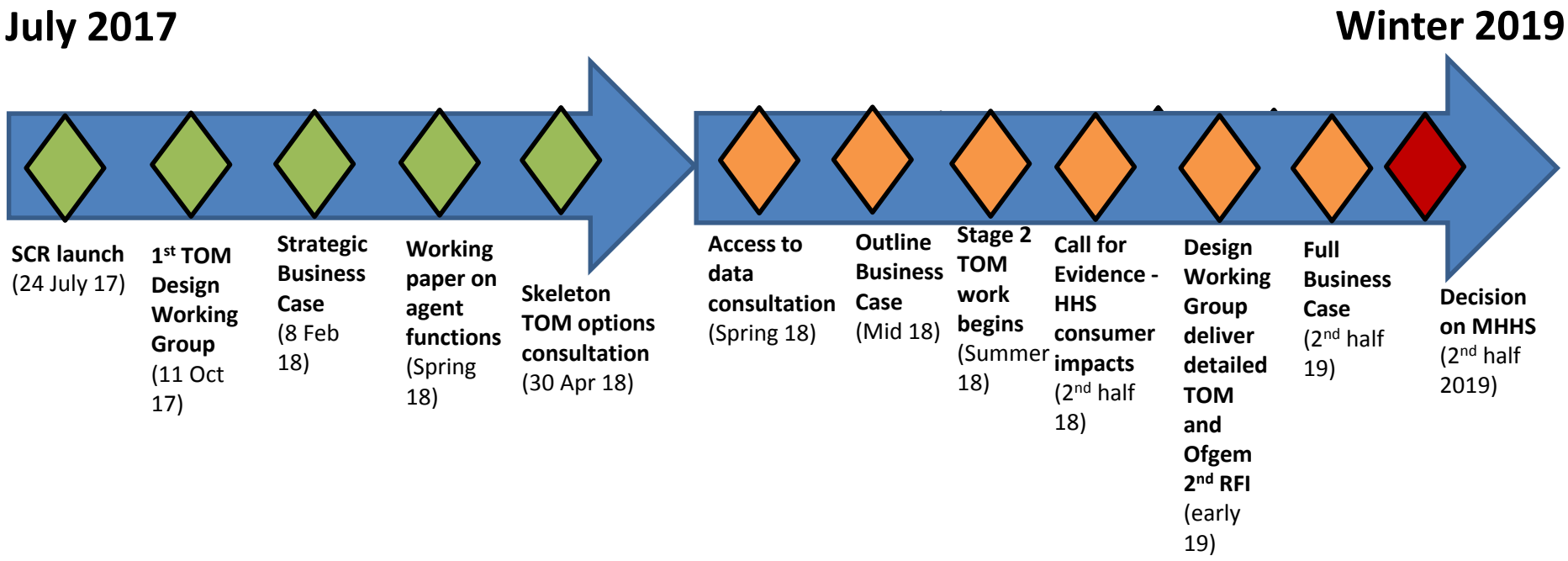
Realising the benefits



Realising the benefits

- Settlement Reform exposes suppliers to the true cost of supply consumers
  - incentivises development of new energy products to help customers be more engaged and move consumption away from peak/expensive periods
  - should lead to more efficient investment, and use of, generation and network infrastructure
- We are also exploring the potential distributional impacts of Settlement Reform
  - commissioned CEPA in 2017 to look into distributional impacts of smart tariffs. Findings available at: https://www.ofgem.gov.uk/publications-and-updates/distributional-impacts-time-use-tariffs
  - will further explore distributional impacts as part of our impact assessment

Project Update



Business case

We are following HM Treasury best practice guidance to develop a Business Case based on the 5 Case Model methodology. This will include an economic impact assessment (the Economic Case).

Feb 2018	Mid-2018	2nd half 2019
Strategic Outline Case	Outline Business Case	Full Business Case
• Sets out the strategic case for change • An initial outline of the scope of economic costs and benefits • Initial thoughts on the other three cases	• Economic assessment of high level options for Settlement Reform, outlining potential range of costs and benefits • Developed thinking on commercial, financial and management cases	• Detailed costing of specific options • Relies on Target Operating Model work and policy decisions • Set out plans to manage and deliver reform and the transition to market-wide HHS

See:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/469317/green_book_guidance_public_sector_business_cases_2015_update.pdf

Policy and Consumer Questions

Ofgem is leading on consideration and decision making on the following policy and consumer questions separately from the Target Operating Model development:

Approach on whether or not to centralise functions currently performed by supplier agents

The potential impacts on consumers of Settlement Reform and whether any additional protections will be needed as result

Approach to access to data for settlement

- Access to half hourly data from smart meters is currently on an opt-in basis
- Gathering evidence on full range of approaches

Access to data for settlement options

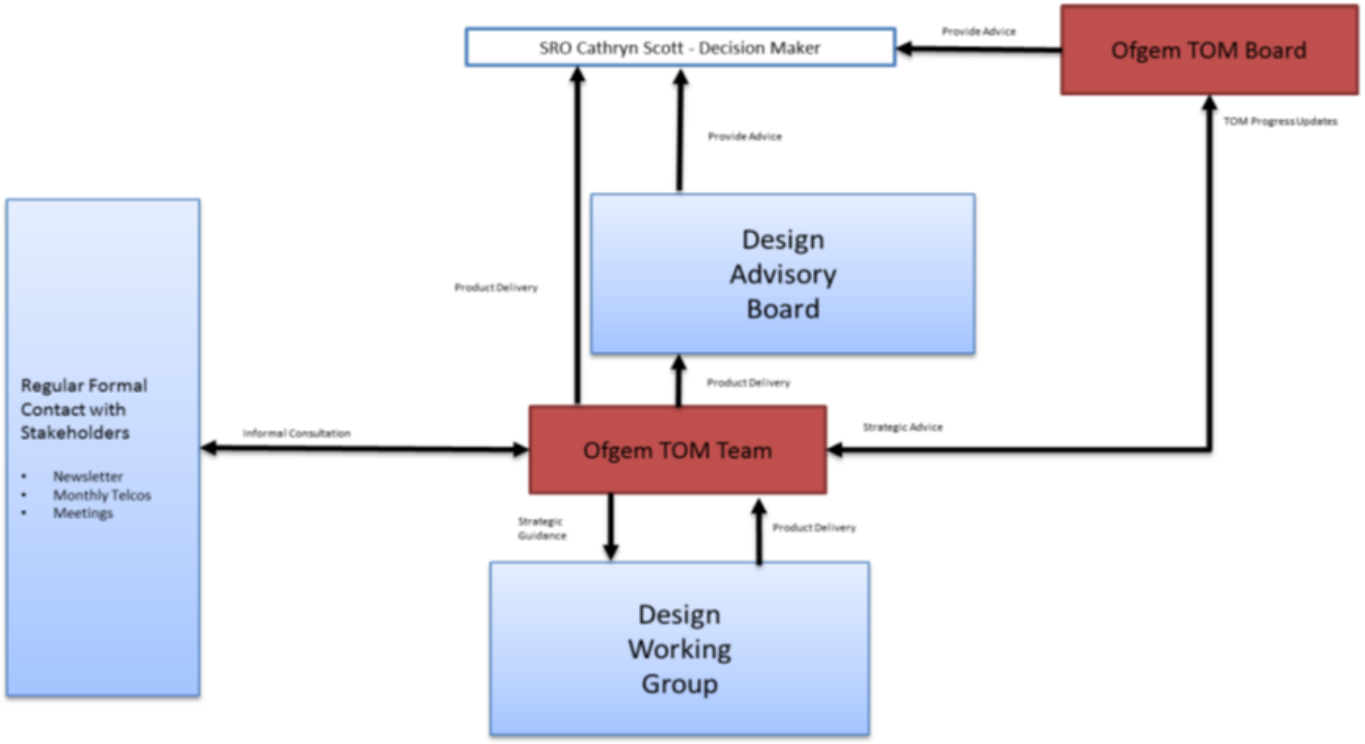
No	Option
1	Access to half-hourly data subject to existing data access rules (opt-in) (the status quo)
2	Half-hourly data is available for settlement purposes only with an option for consumers to opt-out
3	HH data is available for settlement purposes only
4	HH data is available for settlement purposes only following pseudonymisation (MPAN replaced with unique identifier)
5	HH data is available for settlement purposes only following anonymisation (MPAN removed at an early stage of the settlement process)

Target Operating Model

- The Target Operating Model (TOM) will set out the transitional and enduring settlement arrangements which will deliver Settlement Reform
- We want to ensure the TOM is future-enabling and does not impede new technologies and business models. For example:
  - Electric vehicles
  - Demand-side response (local and wholesale)
  - Peer to peer trading
- Design of the TOM is being undertaken by an ELEXON-chaired Design Working Group (DWG) that will provide design options to Ofgem.
- Ofgem retains all decision-making authority on the TOM options

Target Operating Model

- Ofgem governance arrangements for TOM design work



Target Operating Model

- The DWG have met regularly since October 2017 and have developed 5 high level ‘skeleton’ TOM options, which are currently out for consultation
- Ofgem has approved the TOM design work to move to the next stage – detailed design work. Detailed design work will cover interaction with network charging
- DNO representation on both the DWG and DAB

Public

Market-wide Half-Hourly Settlement

The ELEXON led Design Working Group

23 May 2018

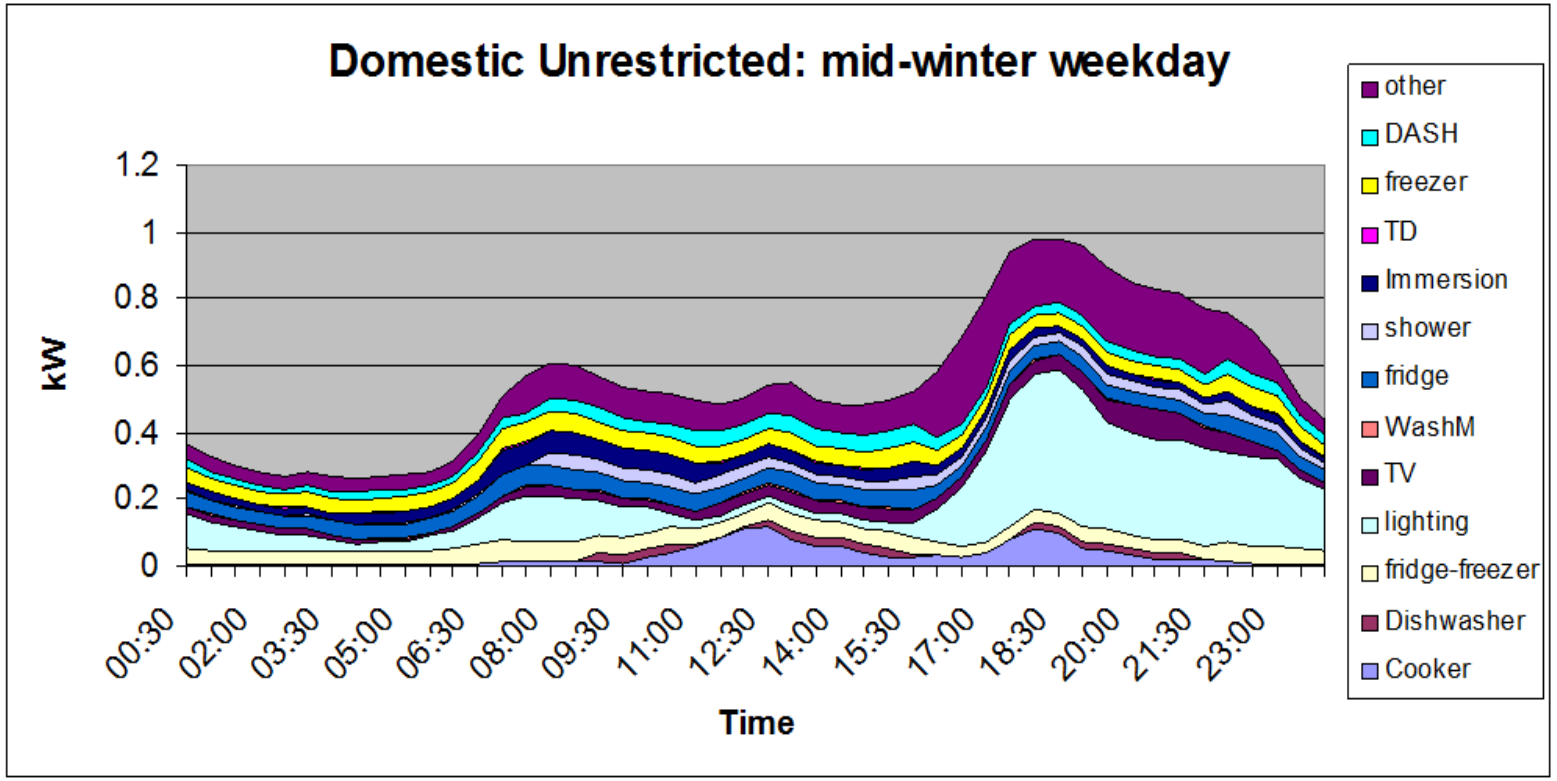
Kevin Spencer

Overview

- Changing energy usage
- DWG: Data and interfaces
- MHHS Context
- Challenges and Unknowns
- Design Work so far
- Summary and next steps

Demand profile

- Example PC1 Domestic Unrestricted: How will it change with new technology and would profiles be accurate?



Design Working Group: Data and interfaces

MHHS Context

- 1998: supply competition implemented profiling because of meter capability
- Waiting for HH capable meters, make arrangements simpler
- ELEXON looking at improvements to settlement process since 2010
  - PSRG and SRAG work: Profiling, P272 and elective HHS process changes
- CMA remedy and Ofgem consultation
  - We offered expertise to lead on settlement design aspects of HHS

- Ofgem launch SCR take up ELEXON's offer of settlement design
- Lead through expert group (DWG)
- Delivery of TOM, options, assessment, interaction with policy and business case
- 2 phases of work:
  - Initial set of options (TOM) and assessment Oct 2017– April 2018
  - Detailed development with report to Ofgem Q1 2019

Design Work so far

Target Operating Model

TOM: Baseline Principles

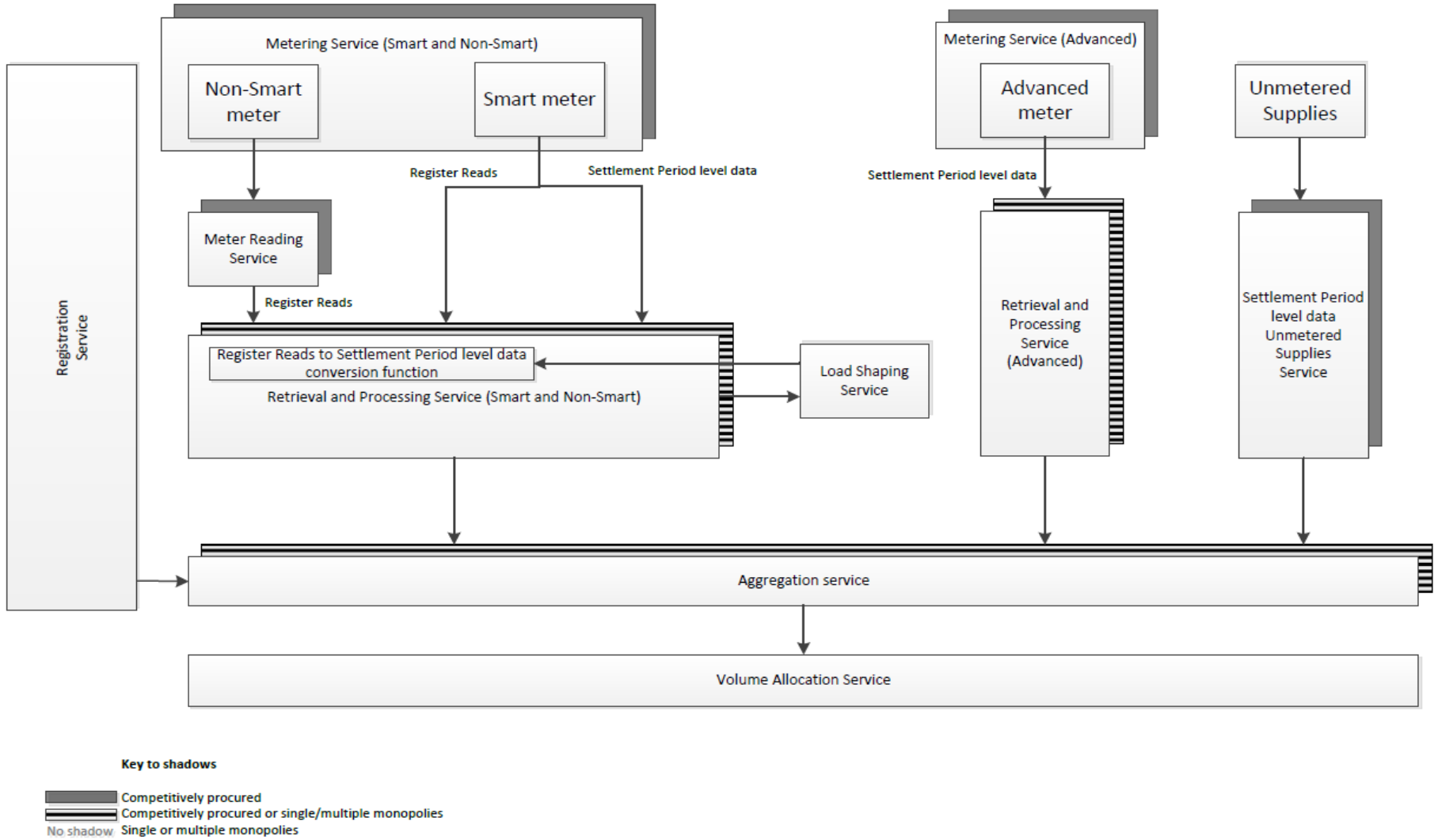
DWG have 8 baseline principles:

1. **be optimised for the longer term 'target state' where the majority of Meters will be Smart or Advanced. Any Meter not either of these should be managed as part of the transitional arrangements;**
2. **only consider as transitional states (and not the final TOM option) any designs that use the existing Elective HH and Non Half Hourly (NHH) settlement arrangements;**
3. cover HH meter data (Active Import and Active Export) for Settlement purposes only. While non-settlement activities (such as billing) are out of scope, the design will aim not to be detrimental to these;
4. **aim to design out elements of the existing Non-Half Hourly (NHH) profiling process such as the use of Annualised Advances (AAs) and EACs (EACs);**
5. aim to have at least one TOM aligning with the policy developments for data privacy and consideration of agent functions;
6. not consider technology or architecture factors at this stage;
7. consider any new Unmetered Supplies arrangements only once a framework is in place for the metered segments of the market so as not to constrain the possibilities for the TOM design; and
8. not consider Settlement timescales until TOM options have been further developed.

TOM development: Market Segments

- Market segments differentiation
  - Smart Meter
  - Legacy Meter
  - Advanced Meter
  - Unmetered Supplies

Target Operating Models (example TOM)

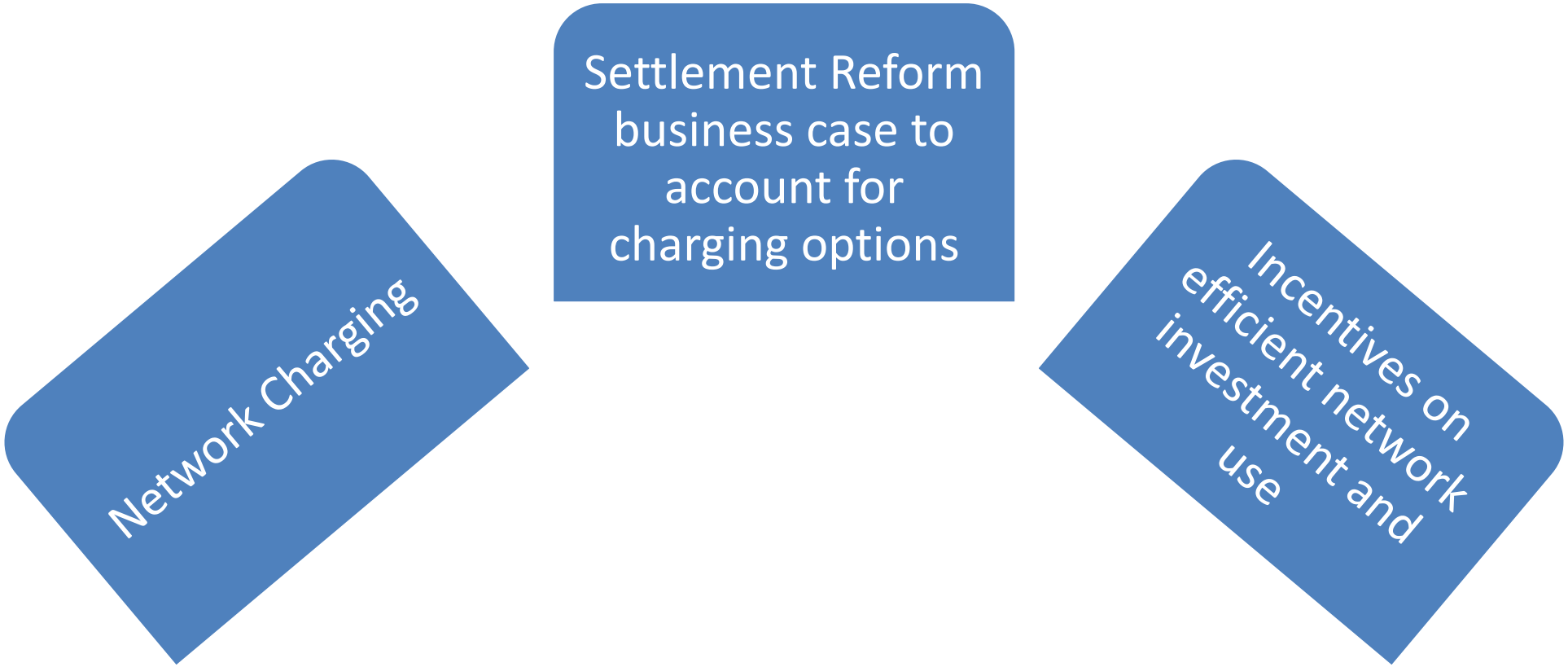


Market-wide HHS Next Steps

- DWG have agreed 5 potential TOMs
- ELEXON Industry Consultation being undertaken
- Review the responses to consultation
- Develop detailed requirements for Services
- Look at options for transition

kevin.spencer@elexon.co.uk
0207 380 4115

Practical interactions: Settlement Reform/TCR/Access



How to get in touch

If you would like to find out more or be notified of future updates, please go to the Settlement Reform website: https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/smarter-markets-programme/electricity-settlement

Any questions, please email: half-hourlysettlement@ofgem.gov.uk

Settlement Reform Project

Q&A

George Huang, Ofgem

Kevin Spencer, Elexon

Charging Futures

Reforming electricity charging together

Forum

Lunch

12:35 – 13:25

Electricity Network Access Project:
Project Overview

Jon Parker - Ofgem

Recap: what are access rights & forward-looking charges?

Network access rights

- The network capacity a user has allocated to them in order to import or export electricity from their target market
- Requires a connection from the user's equipment to the wider network, and then **allocated capacity on that wider network**

Forward-looking charges

- The elements of network charges that look to **provide signals to users about how their behaviours can increase or reduce future costs on the network**
- Includes connection charges and elements of use of system charges

Charging Futures

What are we trying to achieve?

Accommodate new loads while minimising network costs

Support effective competition, including across T&D users

Help reveal the need for and achieve efficient risk allocation of network investment

To help minimise consumers' bills while supporting decarbonisation and the maintenance of security of supply

Provision of network access to consumers as befits an essential service, particularly for those in vulnerable situations

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Why are we looking at this now?

- Prospect of increased network constraints as use of the network changes
- New opportunities from smart and flexible technology to maximise capacity
- Growth of embedded generation – need for more consistency across transmission and distribution

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Building blocks of access and forward-looking charges

Network access arrangements		Forward looking network charges	
Nature of access rights	Time aspects	**Structure of the charge**	Types of costs
			Types of charge
	Firmness		Basis of charge
	Geographical nature		Timing of payment and degree of user commitment
	Associated conditions	**Level of granularity**	Locational granularity
Allocation and reallocation	Initial allocation		Types of locational signal
	Reallocation and trading		Temporal granularity

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The work to date

- In November 2017, we published a working paper on “Reform of electricity network access and forward looking charges. We also held workshops on some potential options for change in Glasgow and London (at the last CFF).

- We commissioned Baringa to develop and implement an analytical framework and gather evidence to assess the materiality of current inefficiencies.

- We set up two industry Task Forces under the CFF to help assess the options for the change. The TFs have published three outputs. The latest report – a document identifying the initial options for further assessment was published last week.

We want to use today’s session to provide you with an overview of Baringa and the TF’s work

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Our way forward

- The TF report, Baringa work, the feedback that received via the CFF/workshops and our own analysis will inform how we intend to take this forward. We expect to publish a consultation on the direction of travel in Summer 2018.

- **We want to hear views from you on our high-level direction of travel.**
  - Once it is published, please response to our consultation.
  - We intend to present and seek views from the next CFF.
  - We also want to use other mechanisms to engage with stakeholders and receive feedback (eg webinars, podcasts). If you have ideas for how we could do this – let us know.

- We envisage making a decision on the high-level direction of travel around the end of the year.

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Electricity Network Access Project:
Baringa Analysis

Nick Screen - Baringa

Analytical framework for network access and forward looking charges

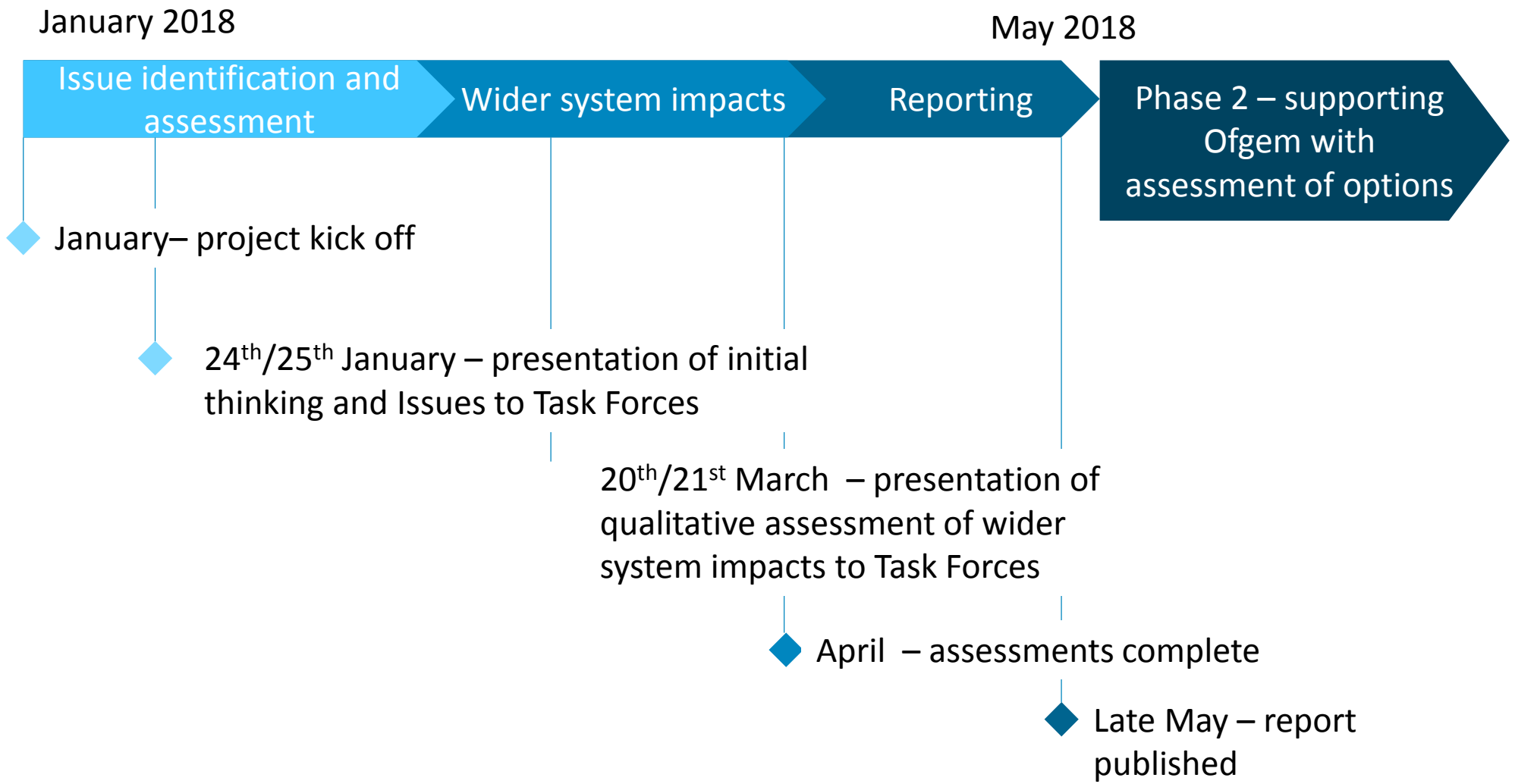
Presentation to Charging Futures Forum

Ofgem

23 May 2018

Introduction

We were commissioned to develop an assessment of the materiality of current inefficiencies in network access and forward looking charging



Identifying issues with current arrangements

The issues are the defects in current network access and forward looking charging arrangements

- The scope of our assessment covered:
  - both **access (connection)** and **forward looking (use of system) charges**
  - at **all voltage levels**
  - both **entry** and **exit** capacity
  - for **all user types**

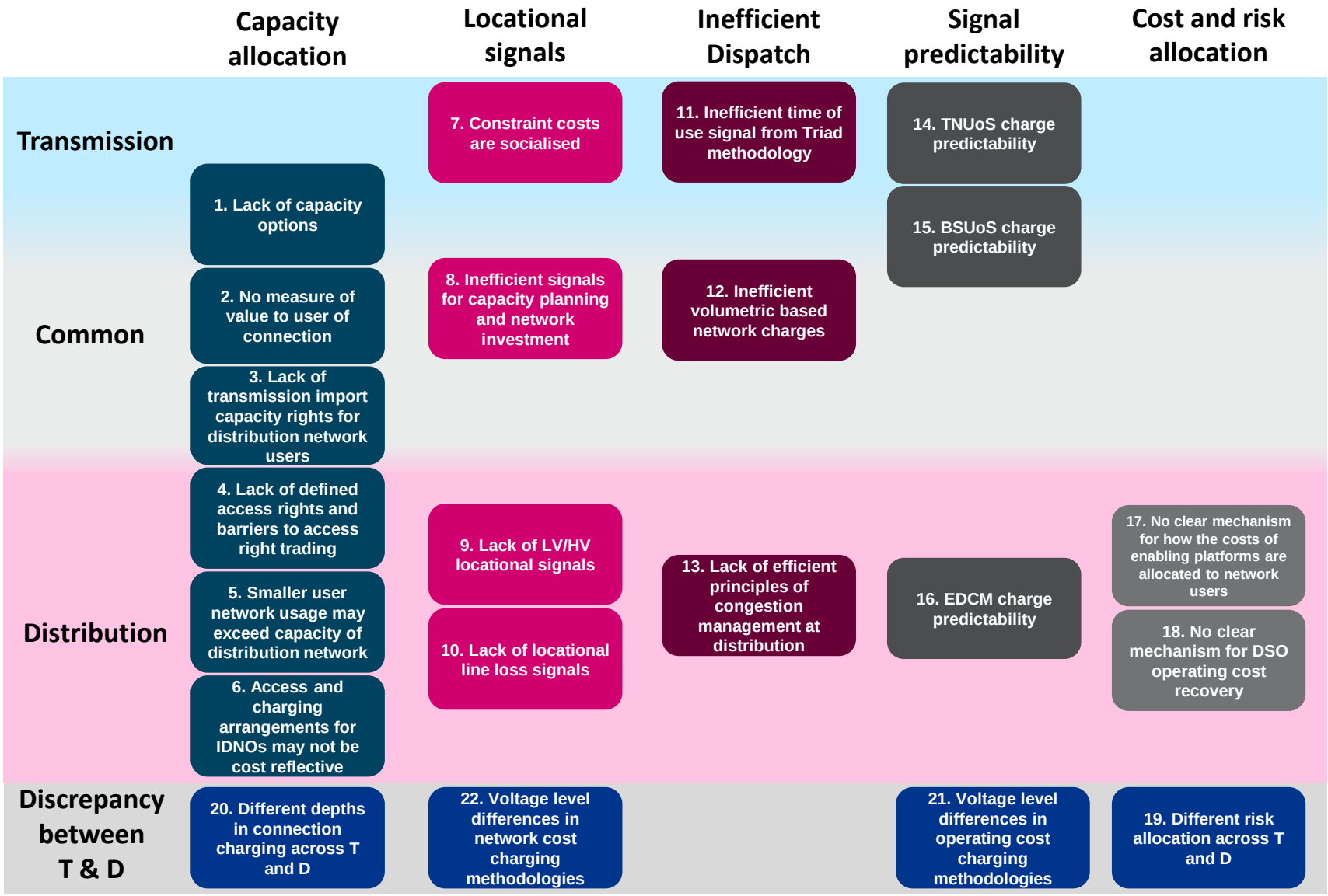
- We considered the critical interlinkages across connections policy, network charges, and possible distortions caused by differences in arrangements at different voltage levels

- Issues with residual charging are excluded as these fall under the scope of the TCR

- The issues draw on Ofgem's November 2017 working paper, and input from the Task Forces

We identified 22 distinct issues with current arrangements

The Issues cut across Transmission and Distribution, and a number of categories



We assessed wider system impacts of the issues

Each of these impacts is explained in our report, along with further assessment and metrics

Current capacity waiting to connect: 1.7GW

Discrepancies in charging contribute to Dx queue and investment costs

The annual constraint costs attributable to capacity connected under C&M as of September 2015 equated to around £40 to 50 per kW of C&M capacity (£122mn total)

Impact area		Deployment barriers	Efficiency of operations	Efficiency of investment	Allocation of risk
Tx	Entry	Medium	Low	Medium	Medium
	Exit	Low	Low	Low	Low
Interface		Medium	Low	Medium	Medium
Dx	Entry	High	Medium	Medium	Medium
	Exit	High	Low	High	Medium

20 GW queue of distribution generation projects

Up to 9 million EVs by 2030 - potential for spare capacity to be used up as early as 2025

Avoided reinforcement cost due to flex/ToU tariffs by 2050: £18mn to £970mn

Conclusions

We identified key high priority areas for reform, which address a number of the impacts

3. Aligning access and charging between transmission and distribution, and across voltage level boundaries

Impact area		Deployment barriers	Efficiency of operations	Efficiency of investment	Allocation of risk
Tx	Entry	Medium	Low	Medium	Medium
	Exit	Low	Low	Low	Low
Interface		Medium	Low	Medium	Medium
Dx	Entry	High	Medium	Medium	Medium
	Exit	High	Low	High	Medium

2. Ensuring that access for distribution connected generation and storage is properly valued and signalled to users

1. Ensuring that access and charging arrangements for households are ready for the uptake of LCTs

Electricity Network Access Project:

Access and Forward-Looking Charges Joint Task Forces

Nigel Bessant, Scottish & Southern Electricity Networks

Paul McGimpsey, SP Distribution & SP Manweb

Chris Ong, UK Power Networks

Task Force Approach

- **Stage 1: Initial Options**
  - Building blocks to determine and define various access arrangements, their initial allocation and reallocation.
  - Building blocks for the calculation and structure of forward looking charges
- **Stage 2: Framework Scenarios, Clusters and Assessment Methodology**
  - Scenarios explore initial allocation and re-allocation
  - Clusters consider influences on user investment or operation
  - Charging methodologies and tariff design considered separately
  - Assessment Criteria confirmed and linked to CUSC and DCUSA principles
- **Stage 3: Final report**

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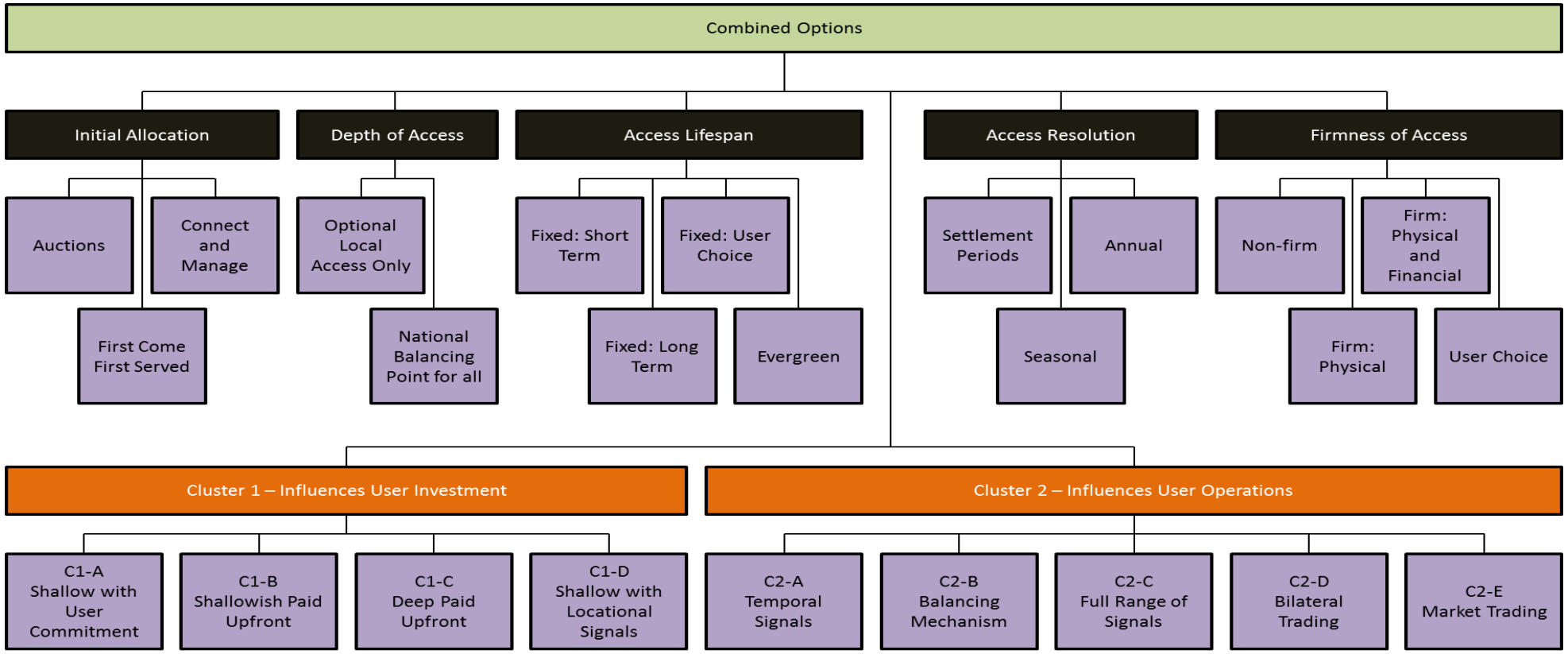
Entire Assessment



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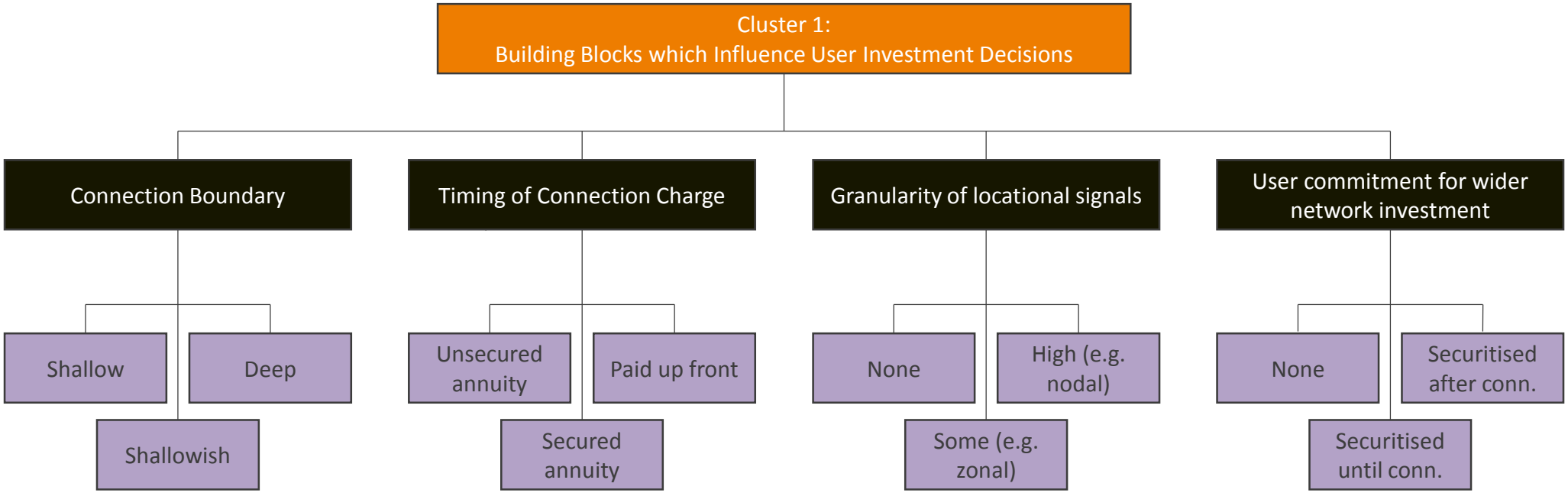
Cluster 1 – Influences User Investment



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Cluster 1 – Influences User Investment

Greater alignment of principles between transmission and distribution

Connection charging boundary:

- Shallow boundary paired with cost-reflective ongoing locational charges favoured by many TF members
- Locational charging may not be feasible or desirable at HV or LV – risks a 'postcode lottery'
- hence, Shallowish boundary may remain appropriate for some users
- Deep boundary is seen as a barrier to investment

User commitment:

- User commitment up to, and potentially for a fixed time beyond, the time of connection reduces the risk of costs associated with stranded assets falling on the wider body of users…
- …but its implementation could be burdensome to deliver for a large number of users
- Need to ensure benefits outweigh costs of delivery

Transitional challenges:

- A move to a shallow connection charging boundary and locational ongoing usage charges could present challenges for existing users (at distribution) who have paid shallowish connection charges

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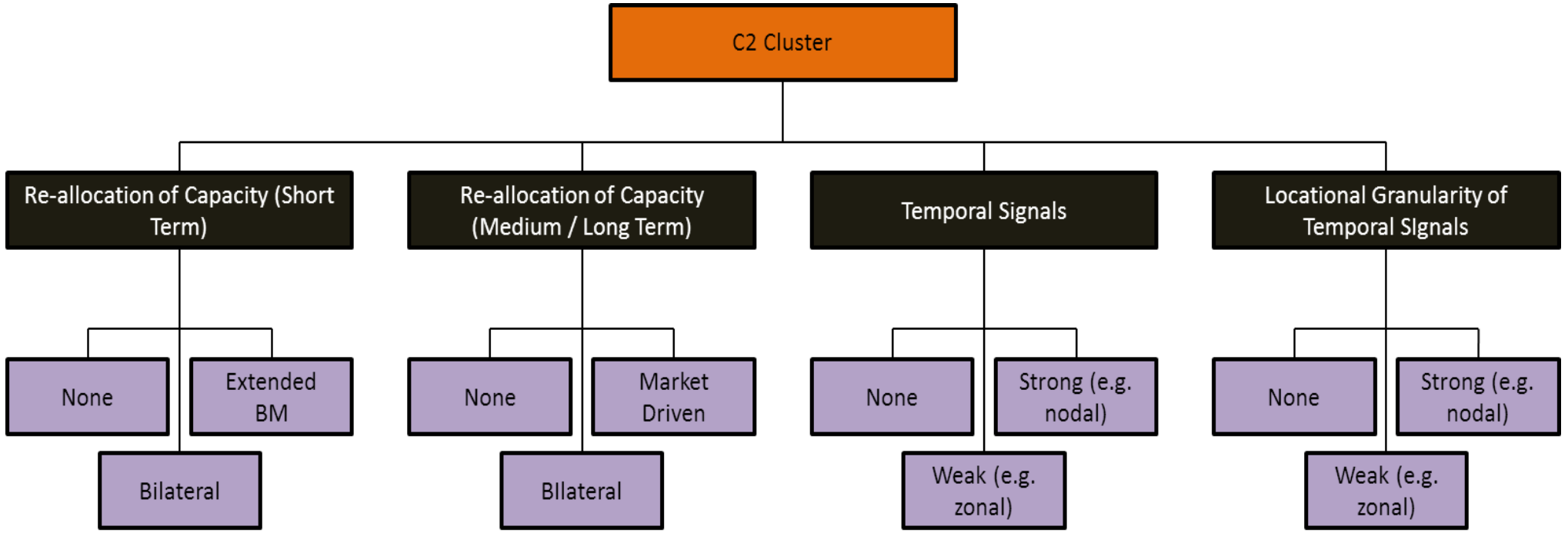
Cluster 2 – Influences User Operations



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Cluster 2 – Influences User Investment

Network Companies could fine tuning real-time user operations

- Extended Balancing Mechanism
- Approaches close to Active Network Management (as on distribution)

Re-allocation of capacity by market-based or bilateral trading requires

- Network planning studies to ensure sufficient network capability
- Exchange rates
- Potentially a capacity threshold for re-allocation
- Ways to ensure a level-playing field between larger and smaller users

Time of Use charges - can have an important role but may not alone be sufficient to guarantee security of supply

Locational charges - can have an important role building on existing models at transmission and EHV. Use at HV / LV would require improvements to existing models

Measures to avoid gaming by market participants

Requires users to have an agreed capacity

Different types of operational signal may be better suited for different users

The many options are not necessarily mutually exclusive but must be coordinate

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Initial Allocation

First come first served

- First come first served **with additional queue management**
- First come first served **with Connect and manage**

Auctions/trading

- **Universal auctions**
- **Targeted auctions**

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Initial Allocation – Auctions

Universal auctions

- access is secured by those who value it most
- Socio-economic consequences of ‘winners and losers’.

Targeted auctions

- e.g. auctions behind specific constraints.
- Requires assessment of would impact current and future network users.

Any form of auction presents significant political, regulatory, economic and operation challenges

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Initial Allocation - FCFS

First come first served

- There will always be an element of first come first served whether it relates to the connections process or in relation to the readiness of a user's project to participate in an initial allocation process.
- Auctions with gate closure may be difficult to align with the timescales of multiple users' construction projects.

Identifying spare capacity for initial allocation

- The reallocation of 'spare' capacity may lead to efficient use of existing levels
- Consideration how the term 'spare' is defined e.g. voluntarily surrendered or require a mechanistic approach based on contracted terms.

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User Perspectives on Access Rights

- **Depth:** General preference for full network access, although some users may only want to be part of a local energy market
- **Lifespan:** Wide range of views from short term (i.e. within a day) to long term (i.e. 40 years plus) and forever...
- **Time of Use:** Wide range of time of use choices from fixed access to varying at different times (i.e. within day, month or year)
- **Firmness (Financial and Physical):** Wide range of views whether financially firm, financially non-firm, or have the choice. However all network users want >99.99% reliability
- **Standardisation of Access:** Mixed response with a leaning towards standardisation

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Access Rights

Wide range of views expressed by Task Force members

- little or no preference for bespoke arrangements
- responses indicated they value choice across all the other access characteristics (i.e. depth, lifespan time of use, and level of firmness).

Core and non-core access rights for domestic and small commercial users connected at LV should be considered

- i.e. a basic capacity for essential services with options to buy additional access for things like electric vehicle charging

Transitional arrangements

- To consider feasibility of offering these arrangements (e.g. the definition of and movement towards financial firmness of DG)
- To consider the relative ease of implementation (i.e. Time of Use may be easier that or local/financially firmness for DG)
- To ensure arrangements are charged in a cost reflective manner

Tariff Design and Modelling

Tariff design and economic modelling needs to be appropriate to the choice of C1 and C2.

Tariffs must be visible and predictable

Time of Use

- If cost-reflective, can create incentives for users to amend their behaviour
- Seasonal tariffs offer a more targeted price signal which may be more cost-reflective
- Further work required to understand the customer response to Time of Use signals

Active network management

- Could profile capacity at distribution, similar to the Balancing Mechanism at transmission.
- BM signals may be in conflict with Time of Use signals

Number of charging arrangements

- Natural split between LV / HV and EHV (Distribution) and Transmission networks.
- The harmonisation, rationalisation, or increase in commonality is seen as beneficial
- Extending EGV/Transmission models to LV and HV has not been attempted before

The design of future tariffs might need to reflect the use of core and non-core capacity

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Tariff Design and Modelling

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Conclusions on further work required

- Assessment of key drivers of costs on transmission and distribution networks
  - Aim to develop a transparent regime where network users can see areas where their decisions will save costs.
- Case study review - how particular options will work in practice, e.g:
  - Targeted auctions for initial allocation and other options for short and long-term trading;
  - Application of core or basic capacity for domestic and small commercial users;
  - New mechanisms for managing unused capacity;
  - Safeguarding newly connecting and existing users form the high costs of rural or space networks; and
  - User's behaviours in response to cost and price signals.
- Assessment of feasibility of:
  - Depth of access;
  - Standardisation of access; and
  - Financial firmness at distribution.
- Mitigation of disadvantages identified by the Task Forces

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Conclusions on further work required

- Implementation and transitional arrangements
- Different approaches for different user types
  - Should take into consideration outcomes for flexibility service providers and ensure vulnerable users are treated appropriately
  - Balancing the needs of existing compared with future users
- Impacts and interactions arising from different options
  - Facilitate greater independent participation or require stronger reliance on intermediaries?
  - Relationship between the options considered and design standards (SQSS and P2/6)
  - Interaction of network charging signals with the BM, Capacity Market and wholesale price;
  - Susceptibility of different options to gaming; and
  - Interaction of different options with potential creation of local markets.
  - impact of options on owners/operators of private networks, independent licensed distribution networks and offshore transmission networks.

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Conclusions on further work required

- The impact and linkages to other strategic programmes:
  - Baringa - impact assessment of the scale of existing issues
  - the Targeted Charging Review
  - the Energy Networks Association's Open Networks programme
  - RIIO-2
  - ongoing changes to retail competition
- The risk of adverse unintended consequences.
- The recovery of network costs incurred in the provision of flexible (ANM) connections

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Electricity Network Access Project: Q&A

Q&A members

- **Facilitator – Louise Schmitz,** NG ESO – Lead Secretariat
- **Jon Parker,** Ofgem
- **Duncan Sinclair,** Baringa
- **Nigel Bessant,** Scottish & Southern Electricity Networks
- **Paul McGimpsey,** SP Distribution & SP Manweb
- **Chris Ong,** UK Power Networks

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Charging Futures

Reforming electricity charging together

Forum

Coffee break

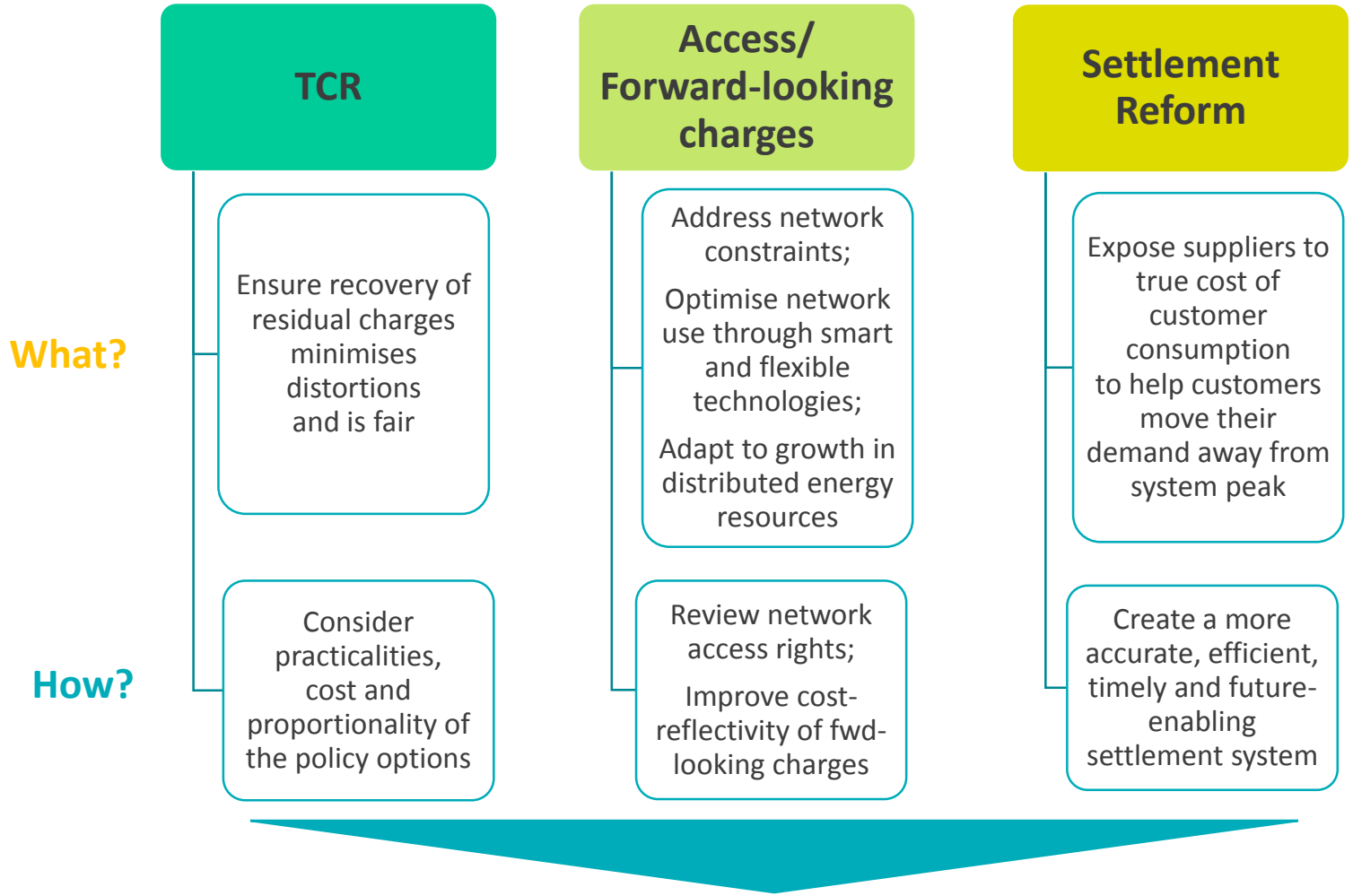
14:55 – 15:15

TCR, Access/Forward-looking charges and Settlement Reform

A look at the overall programme

Frances Warburton, Ofgem

TCR, Access/forward-looking charges and Settlement Reform – the overall programme



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Questions to consider

- Identify two or three key risks/opportunities across the overall programme.
- What policy links and synergies do you see/have concerns about?
- Are there timing issues which give you concern?
- What implementation crossovers need to be considered?
- What IT systems will the reforms impact on? What systems crossovers should be considered (eg settlement systems and network charging systems)?

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Initial reflections on discussions

- **Frances Warburton,** Director, Energy Systems Transition, Ofgem
- **Andrew Self,** Head of electricity Network Charging, Ofgem
- **Anna Stacey,** Head of Settlement Reform, Ofgem
- **Jon Parker,** Head of Electricity System Framework, Ofgem

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Next steps and closing remarks

Frances Warburton, Ofgem - Forum Chair

Objectives for the day

- **Learn** about initial options on Access Rights and Forward Looking Charges from Task Forces
- **Learn** about how the wider landscape and developments in technology are relevant to charging and access reform.
- **Contribute** your thoughts on initial Access Rights and Forward Looking Charges options
- **Ask** your questions to Ofgem and Task Force members

Charging Futures

Your feedback

Go to sli.do

#chargingfutures

Charging Futures

Reforming electricity charging together

Forum

Thank you, and have a safe journey home