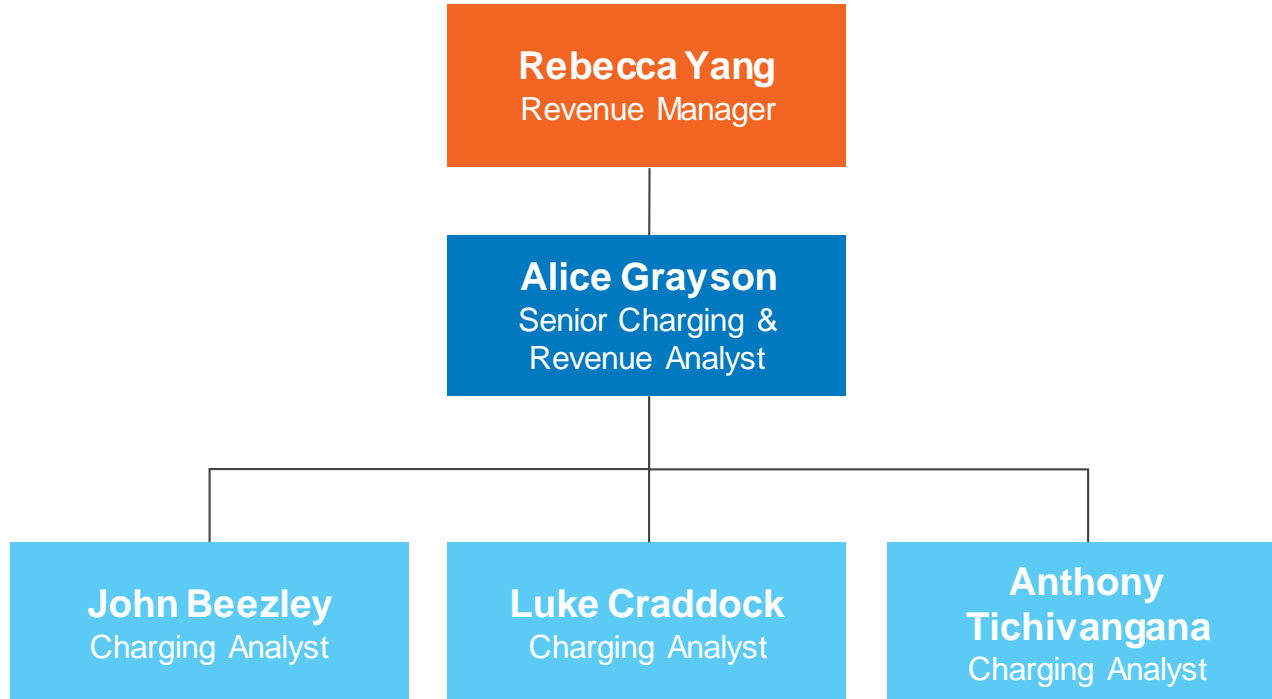


Connection Charging Overview

Anthony Tichivangana



Connection charging team



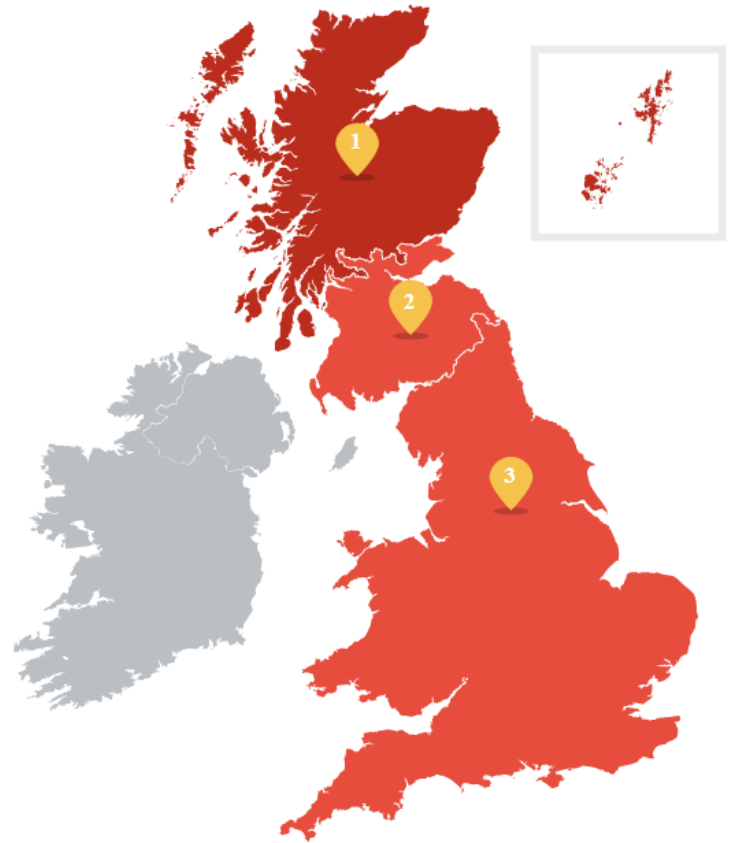
What will be covered in this session

-
- 1 Introduction to Connection Charging
 - 2 Overview of Post Commissioning Security
 - 3 How to use our online charge modeller
-

Connection charges

Connection Charging Team calculate and recover Connection Charges **on behalf of the Transmission Owner.**

Connection charges cover installing and maintaining **sole use assets** which connect users to the National Electricity Transmission System (NETS).



1  Scottish & Southern Electricity Networks (SHET)

2  SP ENERGY NETWORKS (SPT)

3  nationalgrid (NGET)

Connection Charges

nationalgrid

National Grid ESO Charging
Statement

CUSC Section 14

Connection Charging

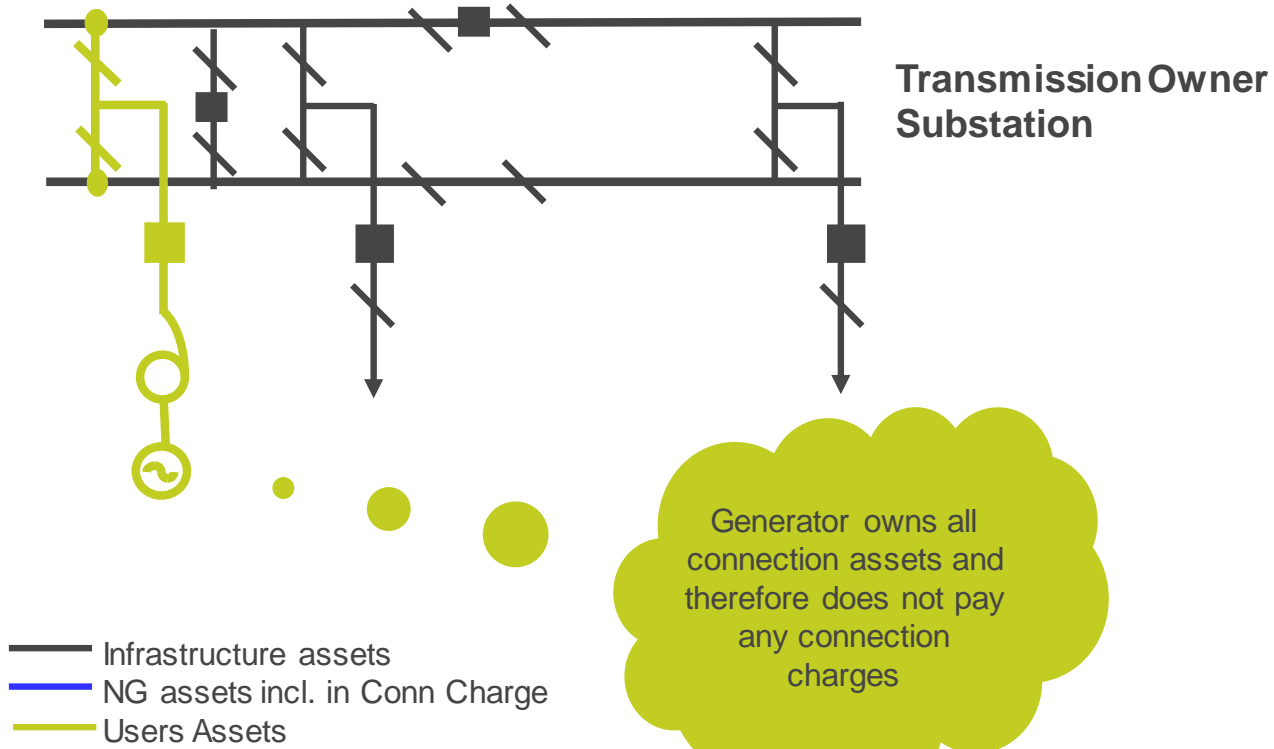
Single user Connection assets

“Connection assets are defined as those assets solely required to connect an individual User to the National Electricity Transmission System, which are not and would not normally be used by any other connected party”

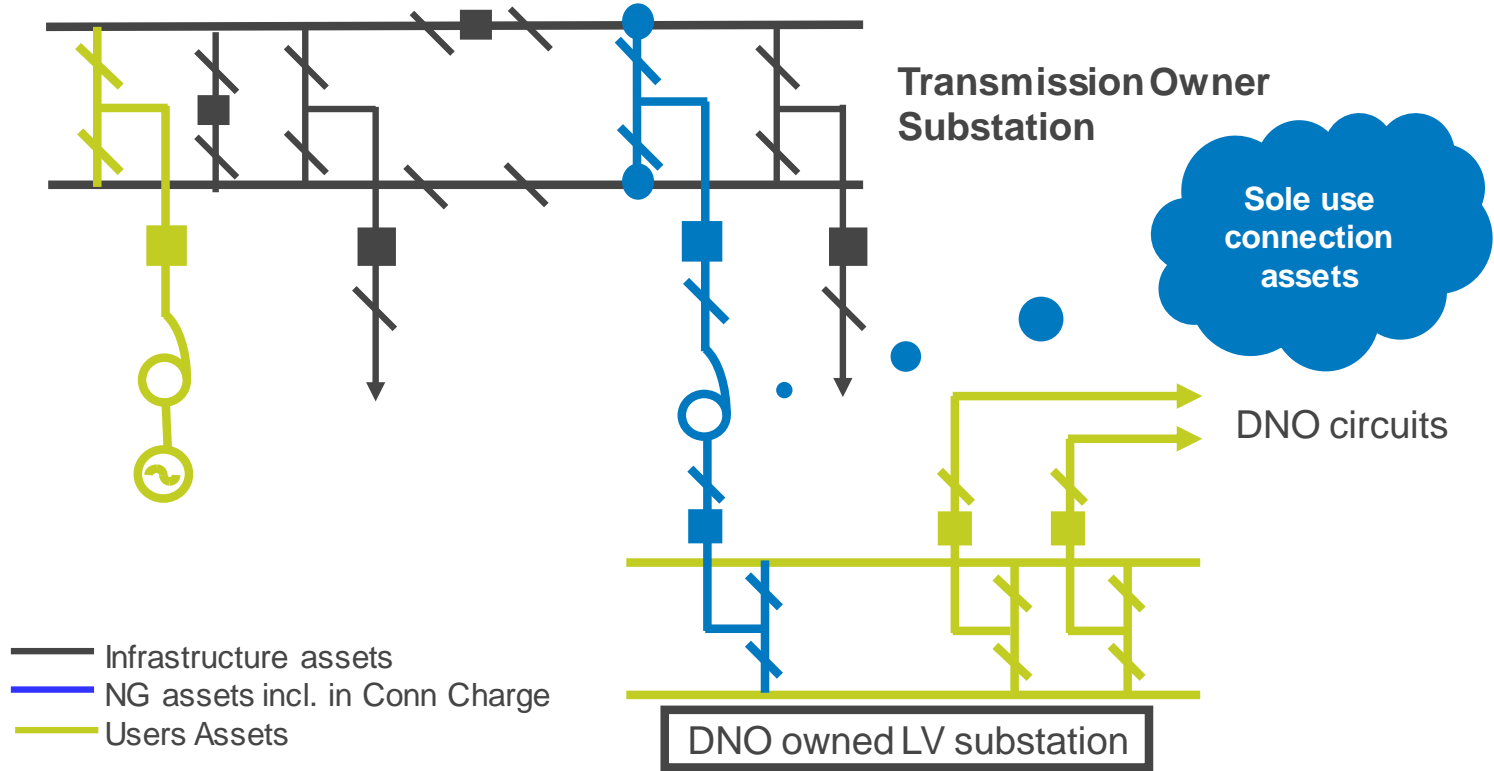
Any shareable or potentially shareable connection assets are classed as infrastructure i.e.

- Substation busbars and associated site infrastructure
- Shared LV substations
- All FMS (Metering) Assets on shared sites

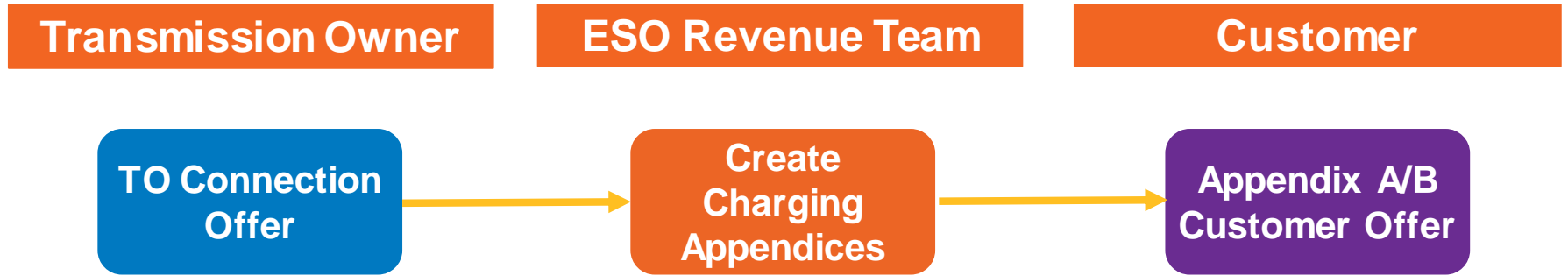
Example connection for Generator



Example connection for DNO



Connection Offer Process



- The Transmission Owner provide the ESO with the cost of the connection asset, Gross Asset Value (GAV)
- We then apply our charging methodology to create a connection charge for customer offers as per CUSC / UoS Charging Statement
- We create charging appendices for difference agreement Types: BEGA, BELLA, BCA
- We create the charging appendices A/B, B1 and D

Charging Appendices Example (Appendix A)

APPENDIX A

TRANSMISSION CONNECTION ASSETS/CONNECTION SITE

User: AT Renewables
Connection Site: Dynamo Push Bike
Type: Entry

Part 1 - Pre-Vesting Assets

<u>Description</u>	<u>Age</u> (As at 01/04/2019)	<u>Year</u>
SGT 1 132/33kV Transformer	35	1984

Part 2a - Existing Post-Vesting Assets

<u>Description</u>	<u>Age</u> (As at 01/04/2019)	<u>Year</u>
SGT 2 132/33kV Transformer	2	2017

Part 2b - New Post-Vesting Assets

<u>Description</u>	<u>Age</u> (As at 01/04/2019)	<u>Year</u>
SGT 1 132kV GIS Bay	0	2019
SGT 2 132kV GIS Bay	0	2019
SGT 1 132kV Cable	0	2019
SGT 2 132kV Cable	0	2019

Part 3a - Existing Energy Metering Systems (*)

Key Points:

- Pre-vesting assets are assets that commissioned pre 1990
- Electronic assets usually have a 10/15 year depreciation where as Non Electronic have 40

Charging Appendices Example (Appendix B)

APPENDIX B CONNECTION CHARGES/PATMENT

User: AT Renewable
Connection Site: Dynama Park Bike
Type: Entry

(1) Connection Charge

The Connection Charge set out below may be revised in accordance with the terms of this Bilateral Connection Agreement and/or the Construction Agreement and/or the CUSC and/or the Charging Statement.

Part 1 – Pre-Vesting Assets

For indication only, the Connection Charge for these assets extant at 31st March 1990 and specified in Appendix A Part 1 will be at an annual rate for the period 01/04/2019 to 31/03/2020 of €19,200.00, in September 2019 prices, where

Rate of Return - 6.00%

Transmission Costs

Part A Site specific maintenance element - €4,500.00
Part B Other transmission costs element - €14,700.00

Part 2a – Existing Post-Vesting Assets

For indication only, the Connection Charge for these assets installed after 31st March 1990 and as specified in Appendix A Part 2a will be at an annual rate for the period 01/04/2019 to 31/03/2020 of €7,200.00, in September 2019 prices, where

Rate of Return - 6.00%

Transmission Costs

Part A Site specific maintenance element - €15,750.00
Part B Other transmission costs element - €51,450.00

Part 2b – New Post-Vesting Assets

For indication only, the Connection Charge for these assets installed after 31st March 1990 and as specified in Appendix A Part 2b will be at an annual rate for the period 01/04/2019 to 31/03/2020 of €48,000.00, in September 2019 prices, where

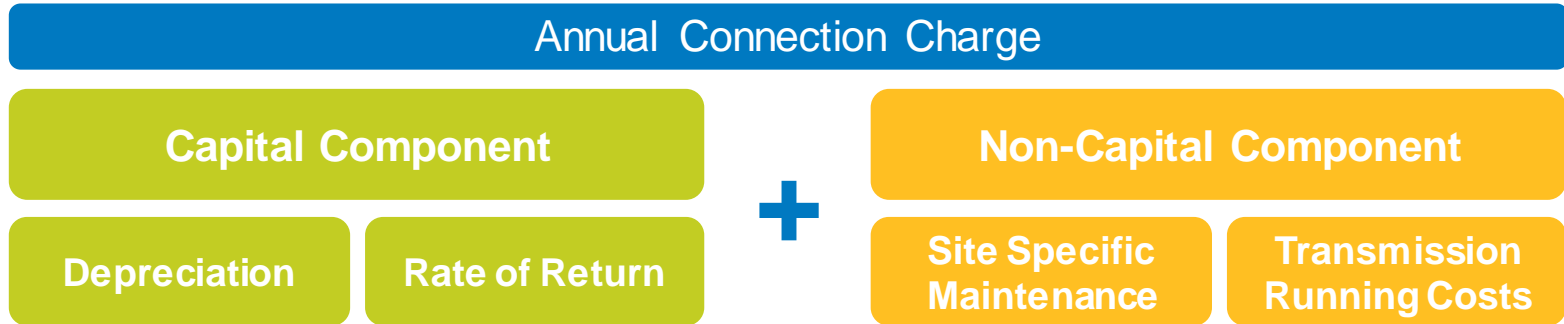
Key Points:

- You are invoiced monthly for the annual charge
- Each year we re-issue your Connection Charging Appendices with your revised connection charge

Page 2

Connection charges

The **connection charge** is calculated annually and payable monthly. It's made up of the following elements:



- Customers can choose to pay all or part of the capital component reduce the monthly connection charge. This is called a capital contribution.
- Non Capital Component is payable for as long as the site is operational, even after the capital component has been paid off.

Connection charges

Interactive session at the end based on this slide!

Annual Connection Charge Example

	Connection Cost	Capital Contribution	Depreciation	RoR	SSM	TRC	Annual Charge
	GAV	Cap Con% *GAV *RoR	GAV/40	NAV*RoR	GAV*SSM	GAV*TRC	
Standard	£1,000,000	0%	£25,000	£59,250	£4,500	£14,700	£103,450
Capital Contribution	£1,000,000	100%	-	-	£4,500	£14,700	£19,200

Acronyms

Gross Asset Value (GAV)

Total cost of asset including:

- Construction costs
- Engineering
- Interest during construction
- Liquidated damages premium

Net Asset Value (NAV)

Total capital element of asset that is yet to be paid

Rate of Return (RoR)

6% of the NAV

Site Specific Maintenance (SSM)

Recovers a proportion of the cost and overheads with the maintenance activities.

0.45%

Transmission Running Costs (TRC)

Rates, operation, indirect overheads incurred by the transmission licensees

1.47%

Capital contributions

Capital Contributions are one-off payments made by the user to pay all or some of the capital element of their connection charges.

Capital contributions can be paid

- before commissioning;
- at the date of commissioning; or
- after commissioning

Example (assuming no inflation and a depreciation period of 40 years)

Capital Contribution	GAV	Annual charge at commissioning	Annual charge in year 2	Annual charge in year 10	Annual charge after 40 years	Total charges paid over 40 years
No capital contribution	£3,000,000	£310,350	£305,850	£269,850	£57,600	£8,904,000
100% in year 10	£3,000,000	£305,850	£305,850	£57,600	£57,600	£7,596,750
50% at commissioning	£3,000,000	£183,975	£181,725	£163,725	£96,225	£5,604,000
100% at commissioning	£3,000,000	£57,600	£57,600	£57,600	£57,600	£5,484,000

Post Commissioning Security

Luke Craddock



What are post-commissioning securities?

Post-commissioning securities are required to cover the owed amount if the user disconnects from the transmission system during the period that the transmission assets are chargeable to the user.

- The Transmission Owners have invested in assets which generally are charged to users over a 40-year life span, but the life span can vary.
- Should the user disconnect from the network the Transmission Owners would not be able to recover the costs of the assets which have been provided.

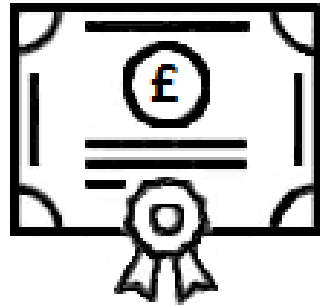


How do customers provide this?

Customers will generally provide security in one of the following forms:



Bank guarantee



Bond



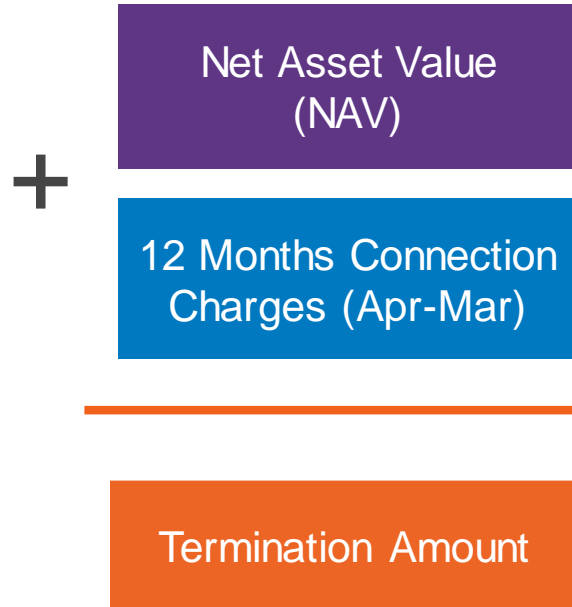
Letter of credit



Cash payment to
be held in a
National Grid ESO
escrow account

How are they Calculated?

In January,



In July,

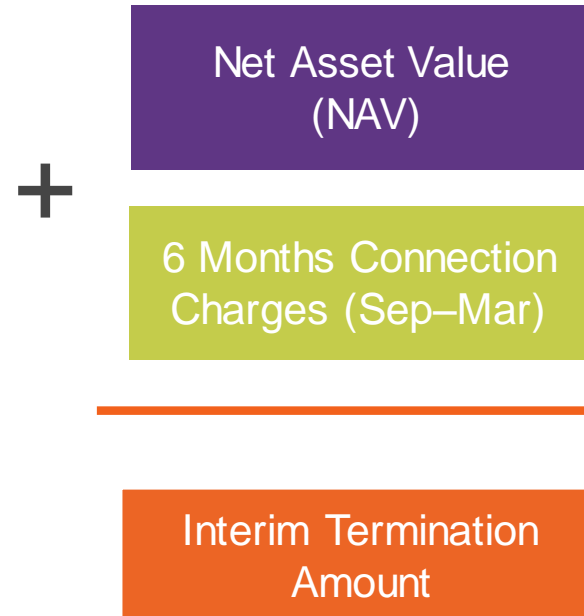


Illustration of Security

Once your Assets have fully depreciated, you are required to provide security for the maintenance of the assets. This is required as long as the assets are operational.

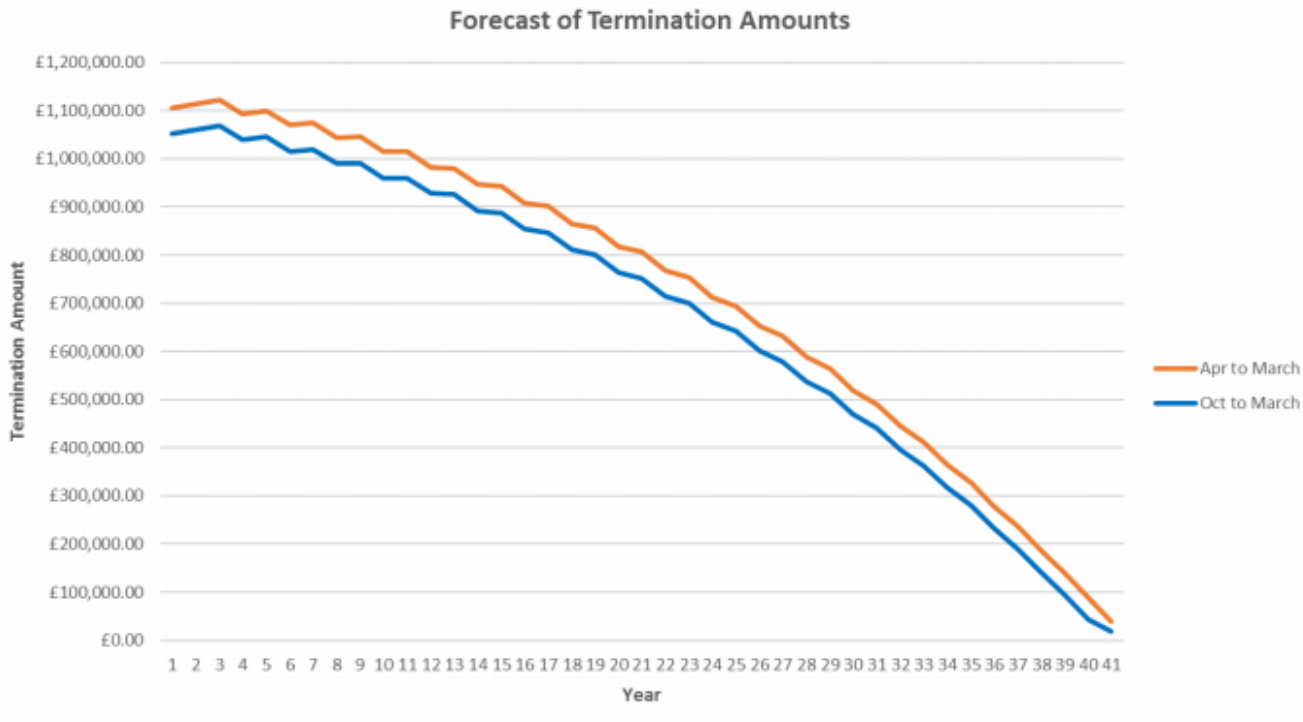
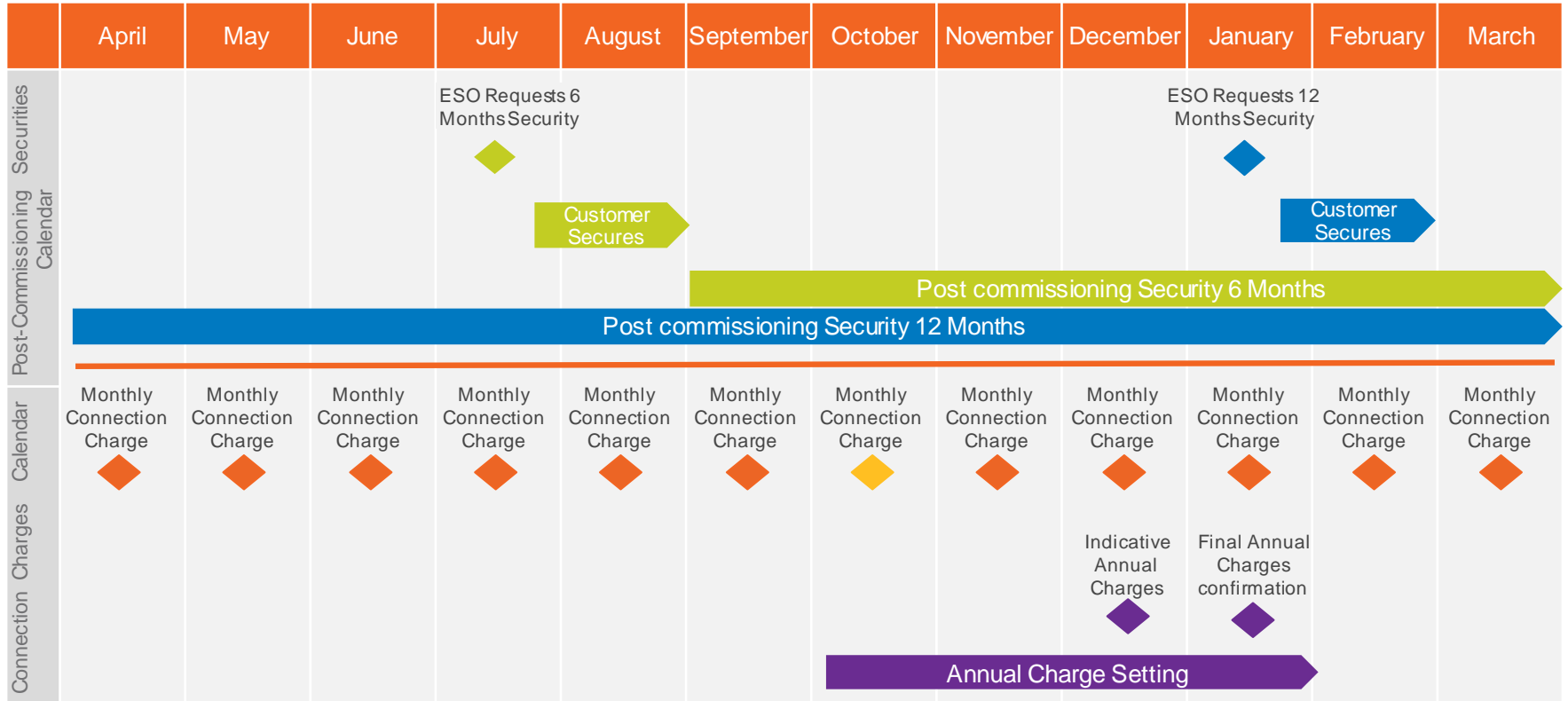


Figure 1: How the Termination Amounts vary over time assuming an initial GAV of £1,025,641.03 with constant inflation 1.33%, SSM of 0.45% and TRC of 1.47%. After the 40 year depreciation, there is no capital charge.

Our Timeline



Interactive Session:

How to calculate a
connection charge

Any Questions?

transmissionconnectioncharging@nationalgrideso.com

Connection Charging Ball Quiz

- 1) What is Rate of Return %?
- 2) What is the depreciation equation?
- 3) What are the non capital elements?
- 4) What is TRC %?
- 5) What does GAV stand for?
- 6) What months do we ask for Post-commissioning securities?

Rules:

- You must find the ball with the right answer for each of the above questions and throw it into the bin!
- The colour of the ball relates to the colour of the question
- The first team to complete this correctly wins a prize - Get it wrong, and you'll have to try again