

# Safety, Resilience, and Reliability Working Group

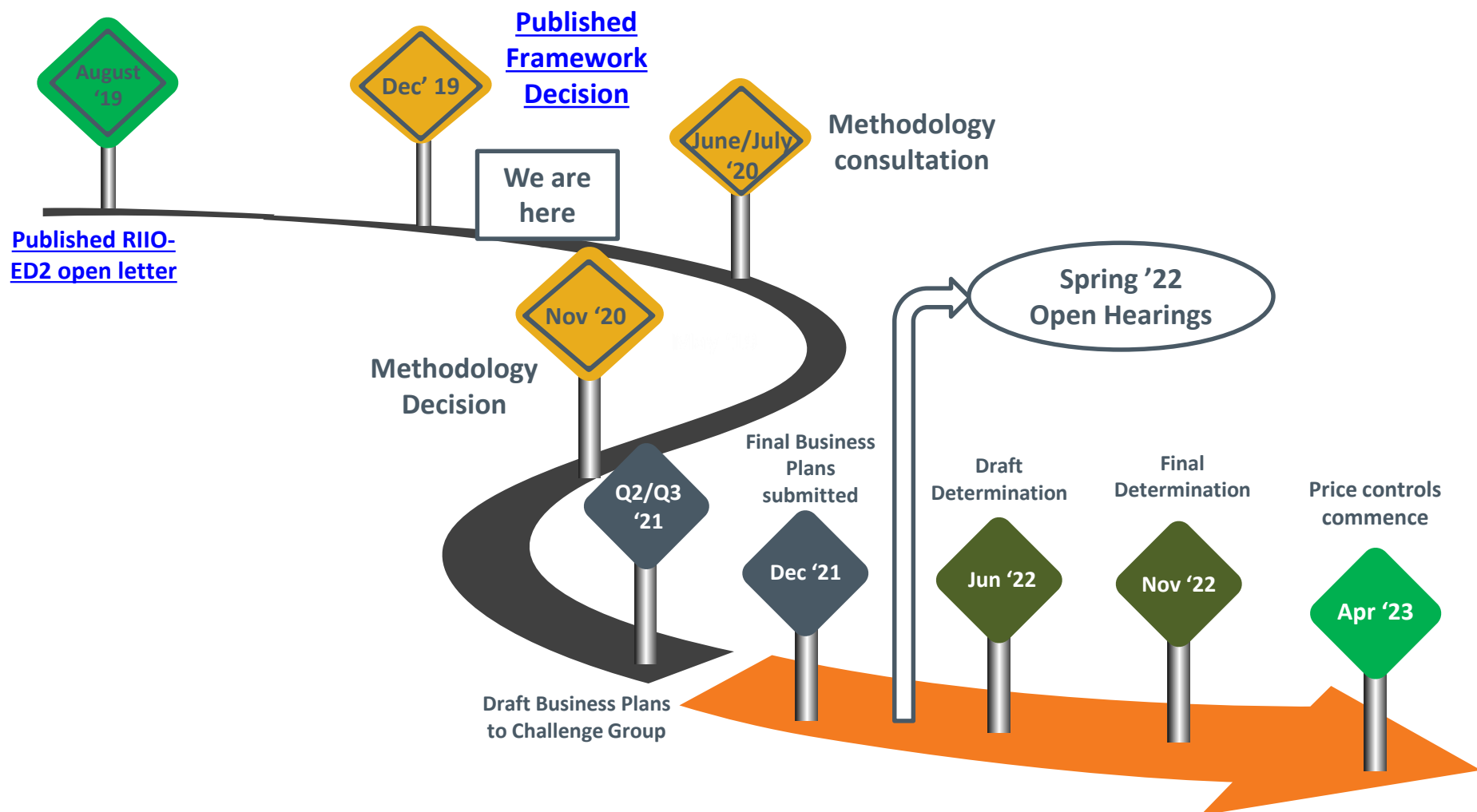
## Meeting 6 – NARM / CNAIM



**RIIO Electricity Distribution**  
12/02/2019

## **Safety, Resilience, and Reliability Working Group**

- Welcome and introductions from Ofgem
- WPD presentation on principles for NARMs in ED2 against the current licence requirements for CNAIM
- Ofgem update on Asset Audit works
- ENWL presentation providing overview of development of CNAIM V2.0
- SSEN presentation on proposals for dealing with Non-NARM assets in ED2 and ED3
- Discussion item on % delivery against target volumes versus % delivery against assets within risk trading arena
- Actions, Next Steps, AOB



- We propose to hold a WG session approximately every other week with feedback sessions to make sure all ground is covered and prioritised appropriately..
- We plan to run sessions in the Glasgow and London Ofgem offices.
- Depending on room availability, we may need to restrict the number of representatives that each member organisation sends to meetings of the Group

Date	Location	Summary	Items to cover
27 November 19	London	First session	ToR, Priorities
05-Dec-19	London	NARM/CNAIM	
09-Jan-19	London	Quality of Supply	
16-Jan-20	Glasgow	NARM/CNAIM	
30-Jan-20	London	Resilience	
12-Feb-20	London	NARM/CNAIM	
18-Feb-20	London	Quality of Supply	
03-Mar-20	Glasgow	Resilience	
18-Mar-20	London	NARM/CNAIM	
31-Mar-20	Glasgow	Quality of Supply	
07-Apr-20	London	Resilience	

# **WPD presentation on principles for NARMs in ED2 against the current licence requirements for CNAIM**

# **WESTERN POWER DISTRIBUTION**



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**Considerations ahead of ED2 NARMS  
Licence Drafting  
12th February 2020**

# Overview

- Established processes exist within the ED sector for the use of Network Asset Indices, based upon a Common Network Asset Indices Methodology, for the ED1 period.
- SLC51 and CRC5D define these requirements.
- ED2 NARMs processes should be built upon the foundations established in ED1, it is suggested therefore that the starting point for considering the licence conditions for ED2 should be to build upon the ED1 licence conditions.
- Consideration of the role and components of NOMs in ED1, and identification of how this will change for NARMs in ED2, needs to inform any proposed licence changes required for ED2.

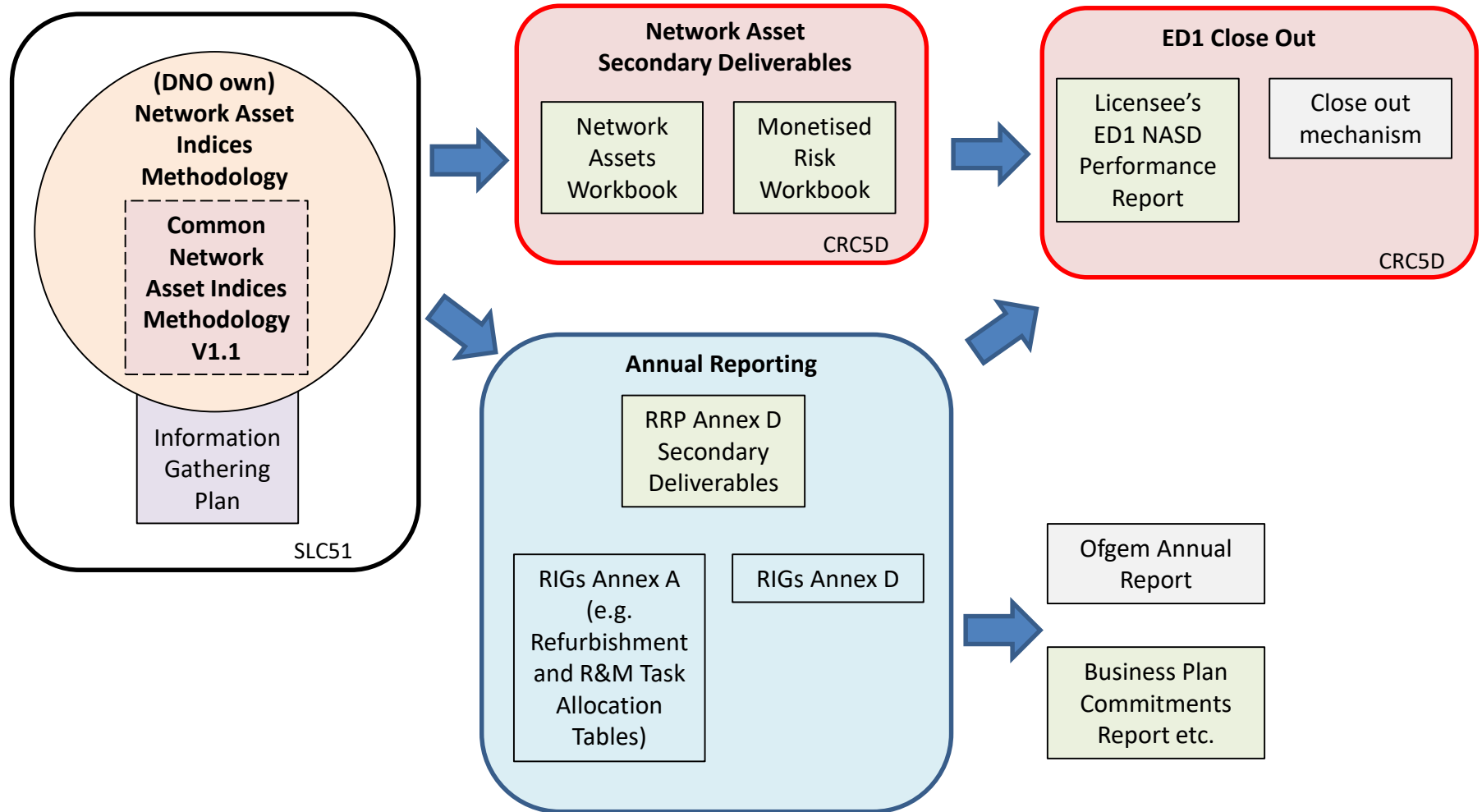
# Building on ED1

For ED1:-

- SLC51 mainly relates to the methodology for calculation of Network Asset Indices (incl. commonality);
- CRC5D sets out:-
  - the basis for assessment of delivery against the Network Asset Secondary Deliverables output measure; and
  - incentives relating to over/ under delivery;
- the close out mechanism is separately defined; and
- annual reporting requirements are defined in the RIGs Annex D.



# Components of ED1 Processes



# Terminology

**Q. Different terminology will exist in RIIO-2 relating to the introduction of 'NARMs'. What are the equivalent terms to the ED1 terminology?**

ED1 Term	Definition
<b>Network Asset Indices</b>	The Network Asset Indices are: the "Health Index"... the "Criticality Index"... and the "Risk Index"
<b>Risk Index</b>	... a monetised metric, derived from a combination of the probability of failure of the Network Assets, and the consequences of failure of these Network Assets, summed across all of these Network Assets. The licensee's delivery against the Network Asset Secondary Deliverables will be assessed by reference to changes in the Risk Index....
<b>Network Asset Secondary Deliverables</b>	means the asset health, criticality and risk secondary deliverables set out for the licensee in the Network Assets Workbook.
<b>Network Asset Indices Methodology</b>	means the licensee's methodology for assessing its Network Assets and Distribution System against the Network Asset Indices in accordance with the RIGs, and also its delivery of the Network Asset Secondary Deliverables.

**Defined Terms in 'draft NARM objectives' from the other three sectors (as circulated to SRRWG in January 2020):-**

**Network Asset Risk Metric**

**NARM Methodology**

**Monetised Risk**

**Monetised Risk Benefit**

**Required Network Risk Output**

# Understanding the ED2 output

- Ofgem have indicated that outputs in ED2 will be regarded as either:-
  - Licence Obligations (LOs);
  - Price Control Deliverables (PCDs); or
  - Output Delivery Incentives (ODIs).
- The treatment of NARMs within this framework of outputs needs to be considered when the ED2 licence is drafted.
- The 'RIIO-2 Sector Specific Methodology Decision - Gas Distribution' shows NARMs as 'PCD/ODI'

**Q. Where do the NARMs outputs fit within the framework for ED2 outputs?**

**Does it follow the example of GD where NARMs appears to be considered as a hybrid?**

**What are the features of this output (e.g. rewards, penalties, clawbacks etc.)?**

# Understanding the ED2 output

- Ofgem's RIIO-ED2 Open Letter Consultation (Aug '19) states that PCDs *"are expected to capture those outcomes that are directly associated with baseline funding, such as outputs...that should be delivered to a stated standard or that are significant and/ or high value... funding for delivery of these will be provided, along with a clear methodology of what happens if an output...is not delivered, or is delivered late or to a lower specification"*

## **Q. If NARMs outputs are a PCD:-**

- **when does the "clear methodology" need to be developed? (prior to licence drafting? prior to Business Plan submission?)**
- **how much of the "clear methodology" needs to sit within the licence conditions? What is the interaction of this with close out methodologies?**

# Network Assets Workbook

- For ED1 CRC5D “establishes the Network Asset Secondary Deliverables for the Price Control Period as set out in the Network Assets Workbook” (NAW).
- Within each licensee’s NAW the ‘delta’ between the ‘without intervention’ and ‘with intervention’ forecasts is shown, these form the basis for the Network Asset Secondary Deliverables. This ‘delta’ is expressed as matrix movements for each Health Index Asset Category.
- Risk monetisation of the ‘delta’ is not performed in the NAW, but within ‘monetised risk workbooks’ that are not referenced in CRC5D.

**Q. For ED2 will the NARMs ‘deliverable’ still be defined within the licence framework by reference to the contents of the NAW?**

**If so, does the structure and function of the NAW need to be revised so that it consolidates all elements required to define the ‘deliverable’? Should this also be incorporated within the ED2 BPDT?**

# Information Gathering Plan

- Under SLC51 a licensee must produce an Information Gathering Plan (IGP) “that sets out how the licensee will gather and record information required for its implementation of or revision of the Common Network Asset Indices Methodology”.
- IGPs are submitted to Ofgem for approval.
- IGPs detail “the scope and form of the data that the licensee will collect, and the frequency with which data will be collected”.
- Ofgem’s RIIO-ED2 Framework Decision (Dec ‘19) makes reference to a possible “Asset Data Quality Incentive, which would be designed to drive consistency and improved data quality for all licensees”

**Q. Given that the IGP defines an agreed scope of data and frequency of collection – does it have an interaction with, or role within, any Asset Data Quality Incentive?**

**Does this need to be taken into account in any licence drafting?**

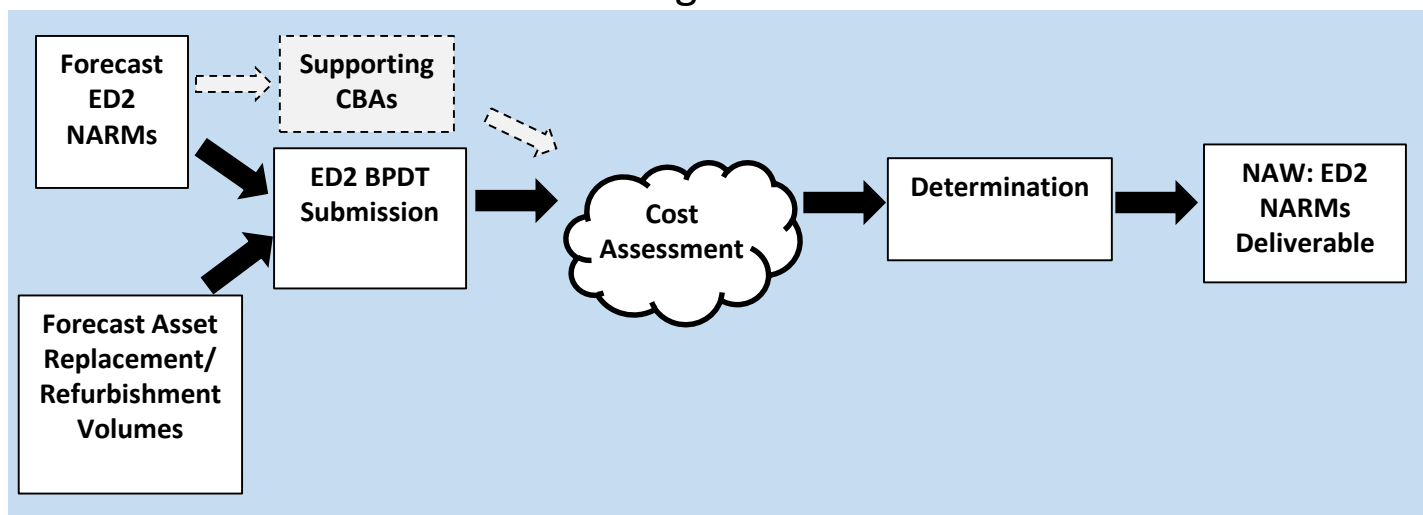
# Network Asset Indices Methodology

- A Common Network Asset Indices Methodology (CNAIM) was developed in ED1, under SLC51;
- In order for CNAIM to be common it needed to be constructed in a way that enabled it to be implementable by all DNOs. This has necessitated a methodology that is prescriptive but also flexible enough to accommodate differences in DNO data collection, Inspection & Maintenance policies etc.
- Under SLC51 DNOs must “have in force and keep under review and, where necessary, modify a Network Asset Indices Methodology... consistent... with the Common Network Asset Indices Methodology”.
- SLC51 has no requirement for submission (or approval) of the NAIM.
- The Network Asset Indices Methodology (NAIM) details the DNO’s own methodology for provision of inputs to CNAIM, using the DNO’s own data and processes (for example data mapping to CNAIM inputs).

**Q. Will there be a requirement to consider a formal submission requirement for the NAIM in ED2? Does it have an interaction with, or role within, any Asset Data Quality Incentive?**

# The role of NARMs in the Price Control

- NARMs will need to be considered as part of the assessment of DNOs ED2 submissions, in order to:-
  - inform cost assessment; and
  - set the NARMs deliverable target



- Allowance adjustments determined from cost assessment shall need to be translated into adjustments to the NARMs deliverable.

**Q. Does a consistent process for adjusting the deliverable within the NAW, following final determination, need to be defined?**



# The role of NARMs in the Price Control

- In previous SRRWG meetings the development of a new version of CNAIM for use in ED2 has been discussed;
- This version needs to be used for the ED2 price control process to ensure that enduring targets for the NARMs deliverable can be considered in the price control process (avoiding rebasing at the start of the period);
- The existing version of CNAIM (v1.1) would still need to be used for reporting performance in ED1.

**Q. Will the ED2 licence need to recognise that different versions of CNAIM may/will run concurrently, each separately approved for use in different periods and for different purposes?**

**Given that the ED2 licence will be implemented from the start of the ED2 period, how is the governance of a new 'ED2 version' for the price control process to be achieved? Does SLC51 in the ED1 licence also need to be supplemented?**

# Use of NARMs in CBAs

- In ED1 the Risk Index is “determined from the Health Index, the Criticality Index and the interdependence between the Network Assets”.
- Previous SRRWG meetings have considered retaining the Health Index/Criticality matrix for representation of NARMs in ED2, but changing the weighting factors used in the derivation of the Risk Index so that it becomes a measure of present value of the cumulative expected future risk to the reliability of the network assets.

		HI1	HI2	HI3	HI4	HI5
Weighting		325.4%	386.5%	498.5%	595.5%	766.8%
C1	320,238	1,041,940	1,237,732	1,596,377	1,906,901	2,455,500
C2	457,482	1,488,486	1,768,189	2,280,539	2,724,144	3,507,858
C3	686,224	2,232,729	2,652,283	3,420,808	4,086,216	5,261,787
C4	1,143,706	3,721,215	4,420,472	5,701,347	6,810,360	8,769,644

Risk  
Index

- Movements in monetised risk due to interventions, shown through the Risk Index, can be directly compared against intervention costs. This can provide a quick cost-benefit comparison technique.

# Use of NARMs in CBAs

- Before assigning a Health Index and Criticality Index to an asset, CNAIM calculates an individual value of probability for failure and an individual value of consequence of failure for the asset. This can be used to determine individual values of monetised risk for the asset.
- The probabilities and consequences of failure calculated for individual assets can facilitate more detailed Cost Benefit Analysis, where required (for example where the Risk Index does not sufficiently demonstrate a positive CBA outcome).

**Q. If the use of NARMs in CBAs is considered as a NARMs objective in the licence, does it need to recognise that the Risk Index is not the only method of quantifying monetised risk benefits?**

# Developing CNAIM

- SLC51 introduced an obligation for DNO's to work co-operatively to develop and implement a Common Network Asset Indices Methodology (CNAIM);
- Clauses relating to the obligation to introduce a CNAIM are no longer relevant, since it has been met;
- SLC51 also includes provision for modification of CNAIM, whereby a "licensee may modify the Common Network Asset Indices Methodology, in cooperation with all other Distribution Services Providers...";
- Clauses relating to co-operative works to develop CNAIM are still relevant;
- In SRRWG, there have been discussions about developing the methodology to produce risk metrics for additional asset categories, for implementation in ED3.

**Q. How should any requirement for a commitment to future development of the methodology be captured?**

# Developing the ED2 licence

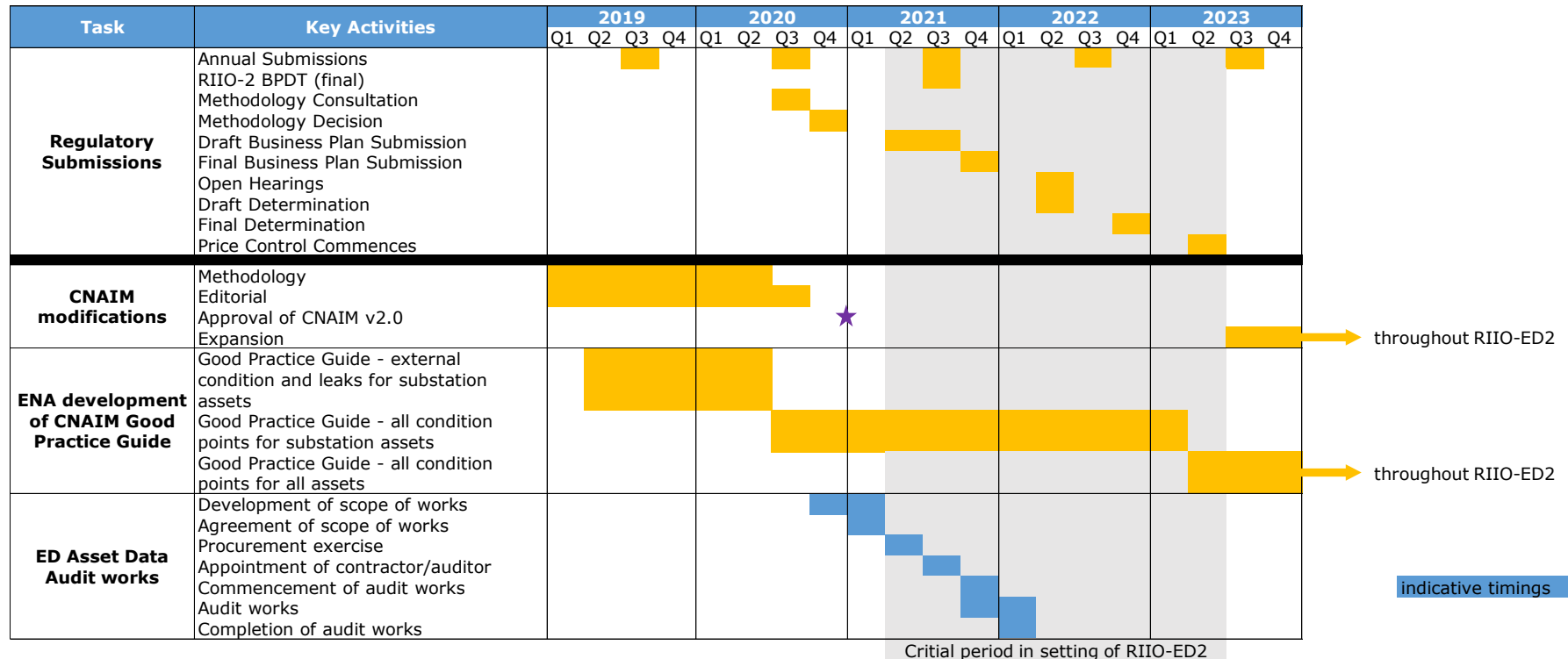
- This presentation has identified that there are a number of areas that potentially need to be understood/ addressed in order to facilitate development of the ED2 licence conditions around NARMs.

**Q. Should SRRWG be looking at any of these areas in the current round of SRRWG (NARMs) meetings? How do issues identified with the GD/T licence condition get fed back to other sectors? Is it acceptable for ED to have different licence arrangements to the other sectors?**

# Lunch

## **Ofgem update on Asset Audit works**

## Indicative timeline for RIIO-ED2 – NARM/CNAIM and Asset Data Audit works



- The first version of the Good Practice Guide (covering external condition and leaks for substation assets) is currently under development and is intended to be issued by the ENA by July 2020.
- CNAIM v2.0 is being developed in parallel, and is intended to be issued by the ENA for approval Q4 2020.
- We are currently proposing that development works for the Good Practice Guide and CNAIM v2.0 should be completed prior to finalising the scope of assessment for the Asset Data Audit works.
- It is critical that we consider carefully the appropriate and logical phase of these works.



## **ENWL overview of development of CNAIM v2.0**



# Development of CNAIM V2.0 - Overview

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- There are four priority areas requiring revision to the Common Network Asset Indices Methodology for use in RIIO-ED2
  - Adoption of Whole Life Risk
  - Expansion to asset groups not currently in the methodology
  - Commonality of Reporting
  - Production of Guidance Document
- The methodology will need to be updated to accommodate the above changes
- There are a number of identified additions to the methodology eg transformer oil based on ED1 experience
- There is also a need for a general refresh & re-calibration
- This set of work is being progressed as the CNAIM2 project



- The original CNAIM process was developed from the existing Condition Based Risk Management (CBRM) system and modified where appropriate to accommodate an agreed level of commonality.
- Due to the time constraints placed on the project some aspects of the development work migrated to a level that permitted unanimity of agreement
- Experience post deploying the methodology has identified a number of issues which require investigation and potential resolution to improve the way in which reporting occurs
- Many of the factors, equations and algorithms within the methodology can be usefully refreshed in light of ED1 experience
- An important principle in the revision is to ensure (so far as possible) that there is continuity between V1.1 and 2 so that outputs are similar



- In addition to the priority areas a number of other areas for improvement have been identified and collated
  - There are 3 main areas identified for attention, these are shown opposite with examples
  - Additionally further guidance is required in some areas of the methodology, these will be included in the Guidance document.
  - A total of 32 discrete improvements have been identified for inclusion in CNAIM2.
- Examples
    - Revision of Calibration eg
      - Update 2013 values to a current price base
      - Confirmation that the value of k and c constants are still valid
      - Review of appropriateness of caps and collars
    - Enhancement of methodology eg
      - Application of IEC oil condition standards to G&P assets
      - Inclusion of Oil Testing for Distribution Switchgear
      - Revision of Distribution Switchgear to align across voltage groups
    - General Updates eg
      - Cable Methodologies review to ensure fitness for purpose
      - Documentation of the methodology improvements



- Whilst listing the improvements that the WG believe required action for RIIO-ED2, a number have been identified where no action is proposed in ED2
- Most of these will be the potential basis for a further review for implementation in the RIIO-ED3, eg
  - Review of single methodology applicable to all assets
  - Further subdivision of asset categories eg tower earth conductors
  - Overall approach to methodology and its interaction with NARMs may require review for future Regulatory periods

# Process & timeline



TASK	KEY ACTIVITIES		2019			2020			2021			2022			2023		
			Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Regulatory Submissions	Annual Submissions																
	(Re)approval of CNAIM																
	RIIO-2 BPD (final)																
Development of CNAIM	Development Initiatives	Agree Scope & Priorities															
		1. Commonality															
		2. Whole Life Risk															
		3. CNAIM modifications	Methodology														
		4. Good Practice Guide	v1.1														
		5. Expansion															
	Approval of CNAIM v2.0																
	IT Systems																
RIGs	Annex A - Glossary																
	Annex D - Secondary Deliverables																
Templates	BPD / NAW (target setting)																
	CBAs (target setting)																
	Annex D (reporting actuals)																

## **SEN/ENWL presentation on proposals for dealing with Non-NARM assets in ED2 and ED3**



**The Voice of the Networks**

# **Energy Networks Association**



**Development of PoF and CoF  
Profiles during RIIO ED2  
Supporting NARMS**

**12 February 2020**

# Development of CNAIM v2.5 Lite

## Summary

This presentation sets out a number of areas for consideration in the development of CNAIM as a possible roadmap to the future needs of asset risk assessment. This is outlined in a five step multi layered modelling approach, these steps are:

- Level 1 - Common Network Asset Indices Methodology v2.0 – most existing asset categories
- Level 2 - Common Network Asset Indices Methodology Lite A – reducing the complexity from v2.0 for some assets
- Level 3 - Common Network Asset Indices Methodology Lite B – Pole Mounted plant and transformers and LV and HV Conductors
- Level 4 - Common Network Asset Indices Methodology Lite C – Cut-out; HV and LV Cables; Batteries; Services (OH and UG) and RLMs
- Level 5 - Excluded from PoF and CoF and hence risk modelling

The term “Lite” is for use in the conceptual creation of the methodology only.

Consideration needs to be taken at this stage on the ‘Risk Trading’ between the different levels and the appropriateness of this as well as the impact potentially on volumes delivered in each category.

# Proposed ED2 Reporting Framework (Recap)

		Reporting methodology				
Level	RRP Asset Categories	ED1	ED2	ED3	Data	Spend in ED1
1	Switchgear, transformers and OHL supports	CNAIM v1.1	CNAIM v2.0	CNAIM v3.0	Excellent coverage at asset level	~60%
2	EHV/132kV cables inc. submarine, OHL conductor & fittings (tower lines)			CNAIM 'Lite A'	Good coverage at asset level	~15%
3	OHL conductor & fittings (pole lines), Pole Mounted switchgear and transformers	Not in scope	Not in scope	CNAIM 'Lite B'	Limited coverage at asset level	~9%
4	Cut-outs LV/HV Cables, batteries, services (O/H and U/G) and Rising Lateral Mains (RLM)			CNAIM 'Lite C'	Limited coverage at population level	~15%
5	All other, e.g. cable bridges			Not in scope	No coverage	~1%

- This will be a continuation of the current CNAIM v2.0 methodology applied to asset types where a large volume of knowledge and data is available. These assets will generally be “point assets” and have been proven to be capable of modelling using these techniques.
- The Table 5.1 below lists the assets which are proposed to be included in this technique:

# Table 5.1 – Level 1 CNAIM v2.0

Asset	Name	Voltage	Units	ED1 Methodology	ED2 Assessment Methodology	ED2 Assessment Methodology
Overhead Pole Line	LV Poles	LV	Each	CNAIM V1.1	V2	V2
Switchgear	LV Circuit Breaker	LV	Each	CNAIM V1.1	V2	V2
Switchgear	LV Pillar (ID)	LV	Each	CNAIM V1.1	V2	V2
Switchgear	LV Pillar (OD at Substation)	LV	Each	CNAIM V1.1	V2	V2
Switchgear	LV Board (WM)	LV	Each	CNAIM V1.1	V2	V2
Switchgear	LV UGB	LV	Each	CNAIM V1.1	V2	V2
Switchgear	LV Pillars (OD not at Substation)	LV	Each	CNAIM V1.1	V2	V2
Switchgear	LV Board (X-type Network) (WM)	LV	Each	CNAIM V1.1	V2	V2
Overhead Pole Line	6.6/11kV Poles	HV	Each	CNAIM V1.1	V2	V2
Overhead Pole Line	20kV Poles	HV	Each	CNAIM V1.1	V2	V2
Switchgear	6.6/11kV CB (GM) Primary	HV	Each	CNAIM V1.1	V2	V2
Switchgear	6.6/11kV CB (GM) Secondary	HV	Each	CNAIM V1.1	V2	V2
Switchgear	6.6/11kV Switch (GM)	HV	Each	CNAIM V1.1	V2	V2
Switchgear	6.6/11kV RMU	HV	Each	CNAIM V1.1	V2	V2
Switchgear	6.6/11kV X-type RMU	HV	Each	CNAIM V1.1	V2	V2
Switchgear	20kV CB (GM) Primary	HV	Each	CNAIM V1.1	V2	V2
Switchgear	20kV CB (GM) Secondary	HV	Each	CNAIM V1.1	V2	V2
Switchgear	20kV Switch (GM)	HV	Each	CNAIM V1.1	V2	V2
Switchgear	20kV RMU	HV	Each	CNAIM V1.1	V2	V2
Transformer	6.6/11kV Transformer (GM)	HV	Each	CNAIM V1.1	V2	V2
Transformer	20kV Transformer (GM)	HV	Each	CNAIM V1.1	V2	V2
Overhead Pole Line	33kV Pole	EHV	Each	CNAIM V1.1	V2	V2
Overhead Pole Line	66kV Pole	EHV	Each	CNAIM V1.1	V2	V2
Overhead Tower Line	33kV Tower	EHV	Each	CNAIM V1.1	V2	V2
Overhead Tower Line	66kV Tower	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	33kV CB (Air Insulated Busbars)(ID) (GM)	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	33kV CB (Air Insulated Busbars)(OD) (GM)	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	33kV CB (Gas Insulated Busbars)(ID) (GM)	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	33kV CB (Gas Insulated Busbars)(OD) (GM)	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	33kV Switch (GM)	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	33kV RMU	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	66kV CB (Air Insulated Busbars)(ID) (GM)	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	66kV CB (Air Insulated Busbars)(OD) (GM)	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	66kV CB (Gas Insulated Busbars)(ID) (GM)	EHV	Each	CNAIM V1.1	V2	V2
Switchgear	66kV CB (Gas Insulated Busbars)(OD) (GM)	EHV	Each	CNAIM V1.1	V2	V2
Transformer	33kV Transformer (GM)	EHV	Each	CNAIM V1.1	V2	V2
Transformer	66kV Transformer	EHV	Each	CNAIM V1.1	V2	V2
Overhead Pole Line	132kV Pole	132kV	Each	None	None	V2.5
Overhead Tower Line	132kV Tower	132kV	Each	CNAIM V1.1	V2	V2
Switchgear	132kV CB (Air Insulated Busbars)(ID) (GM)	132kV	Each	CNAIM V1.1	V2	V2
Switchgear	132kV CB (Air Insulated Busbars)(OD) (GM)	132kV	Each	CNAIM V1.1	V2	V2
Switchgear	132kV CB (Gas Insulated Busbars)(ID) (GM)	132kV	Each	CNAIM V1.1	V2	V2
Switchgear	132kV CB (Gas Insulated Busbars)(OD) (GM)	132kV	Each	CNAIM V1.1	V2	V2
Transformer	132kV Transformer	132kV	Each	CNAIM V1.1	V2	V2

# Level 1 CNAIM v2.0 Work Load

Under this strategy we are currently reviewing and where necessary recalibrating CNAIM v1.1 for ED2 as part of the CNAIM v2.0 undertaking.

This includes the review of :

- Asset Life Expectancy
- Review of existing Caps and Collars
- Determination of PoF and CoF Values for use in June 2021 submission
- Restatement of PoF and CoF values post March 2023 (If any)
- General calibration revisions e.g. Cost of Carbon; Cost of fatality, VoLL and IIS etc

It is proposed that assets within this method shall be mandatory to include in regulatory returns for the period of ED2, as already indicated to Ofgem including:

- The concept of a health index asset category be retired for ED2, instead companies report against 61 asset register category models, ensuring alignment between CNAIM assets and assets reported elsewhere in regulatory submissions.
- All asset register categories within the current CNAIM v1.1 must be declared against a company's NARM monetised risk target, with a NIL return provided for assets a licensee does not own.
- Exception can be sought when a company is not in the position to provide data it feels is suitable to generate suitable outputs from an asset's model.

These three principles will be applied to all further development on CNAIM V2.5 below.

During the operation of CNAIM v1.1 certain asset classes have exhibited difficulties for DNOs to derive and report risk values for, an example of this is the Non-Pressure Cable models at EHV and 132kV where only one Company set itself a target. These will remain for the duration of RIIO-ED2 however this revised Level 2 will be developed during this period in preparation for RIIO-ED3.

In general asset groups in this category are linear in nature or associated with linear assets (e.g. tower fittings).

- Assets in this category of risk measurement will have originally been modelled in CNAIM v1.1 & CNAIM v2.0 or have similar assets which were modelled in that way in ED1 & ED2 A revised methodology based on CNAIM v2.0 will be developed considering available data and ease of collection
- The table 7.1 below list the assets which would be managed under this category of assets for ED3:

# Table 7.1 – Level 2 CNAIM v2.5 Lite A

Asset	Name	Voltage	Units	ED1 Methodology	ED2 Assessment Methodology	ED3 Assessment Methodology
Cable	HV Sub Cable	HV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Overhead Tower Line	33kV OHL (Tower line) Conductor	EHV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Overhead Tower Line	33kV Fittings	EHV		CNAIM V1.1	CNAIM V2.0	Lite A
Overhead Tower Line	66kV OHL (Tower Line) Conductor	EHV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Overhead Tower Line	66kV Fittings	EHV		CNAIM V1.1	CNAIM V2.0	Lite A
Cable	33kV UG Cable (Non-Pressurised)	EHV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	33kV UG Cable (Oil)	EHV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	33kV UG Cable (Gas)	EHV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	66kV UG Cable (Non-Pressurised)	EHV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	66kV UG Cable (Oil)	EHV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	66kV UG Cable (Gas)	EHV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	EHV Sub Cable	EHV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Overhead Tower Line	132kV OHL (Tower Line) Conductor	132kV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Overhead Tower Line	132kV Fittings	132kV	Each	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	132kV UG Cable (Non-Pressurised)	132kV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	132kV UG Cable (Oil)	132kV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	132kV UG Cable (Gas)	132kV	km	CNAIM V1.1	CNAIM V2.0	Lite A
Cable	132kV Sub Cable	132kV	km	CNAIM V1.1	CNAIM V2.0	Lite A



# Level 2 CNAIM v2.5 Lite A Work Load

If this strategy is adopted, then there will need to be a general revision and recalibration of the v2.0 and enhancements where necessary. This may include the removal of some condition or measured factor tables from v2.0 for these assets. These enhancements may be as a result of Ofgem or DNO requirements but will generally be additional data points rather than a reduction.

In addition, it will be necessary to develop and or review issues such as:

- Asset Life Expectancy
- Review of existing Caps and Collars
- Determination of PoF and CoF Values for use in RIIO-ED3
- Restatement of PoF and CoF values post March 2028 (If any)
- General calibration revisions e.g. Cost of Carbon; Cost of fatality, VoLL and IIS etc

It is proposed that assets within this level shall be included at the discretion of the DNO during RIIO-ED2 as the volumes and data collection requirements need to be understood. There also needs to be consideration for an allowance in ED2 to commence the required data collection to develop this during the period in preparation for ED3.

- Introduce an additional information gathering plan in the period of ED2
- Agree an appropriate allowance mechanism to collect this data

These are asset groups that have similarities to those in the CNAIM v2.0 but have significant issues with the ability to collect data and hence modify the model beyond the basic health score based on Age and environment etc. Whilst it may be possible to create a CNAIM style model for these asset groups the ability to modify the asset beyond the initial score is limited.

- As a result of the limitations to accessing or collecting data the values of risk will be less accurate than those created in the CNAIM v2.0 and Lite A variants and this may require some thought when converting the values to risk scores and how these may be treated in any incentives and reporting mechanism.
- The table 9.1 list the assets which would be managed under this category of assets for ED3:

# Table 9.1 – Level 3 CNAIM v2.5 Lite B

Asset	Name	Voltage	Units	ED1 & ED2 Methodology	ED3 Assessment Methodology
Overhead Pole Line	LV Main (OHL) Conductor	LV	km	None	Lite B
Switchgear	LV Transformers/Regulators	LV	Each	None	Lite B
Overhead Pole Line	6.6/11kV OHL (Conventional Conductor)	HV	km	None	Lite B
Overhead Pole Line	6.6/11kV OHL (BLX or similar Conductor)	HV	km	None	Lite B
Overhead Pole Line	20kV OHL (Conventional Conductor)	HV	km	None	Lite B
Overhead Pole Line	20kV OHL (BLX or similar Conductor)	HV	km	None	Lite B
Switchgear	6.6/11kV CB (PM)	HV	Each	None	Lite B
Switchgear	6.6/11kV Switch (PM)	HV	Each	None	Lite B
Switchgear	6.6/11kV Switchgear - Other (PM)	HV	Each	None	Lite B
Switchgear	20kV CB (PM)	HV	Each	None	Lite B
Switchgear	20kV Switch (PM)	HV	Each	None	Lite B
Switchgear	20kV Switchgear - Other (PM)	HV	Each	None	Lite B
Transformer	6.6/11kV Transformer (PM)	HV	Each	None	Lite B
Transformer	20kV Transformer (PM)	HV	Each	None	Lite B
Overhead Pole Line	33kV OHL (Pole Line) Conductor	EHV	km	None	Lite B
Overhead Pole Line	66kV OHL (Pole Line) Conductor	EHV	km	None	Lite B
Switchgear	33kV Switchgear - Other	EHV	Each	None	Lite B
Switchgear	33kV Switch (PM)	EHV	Each	None	Lite B
Switchgear	66kV Switchgear - Other	EHV	Each	None	Lite B
Transformer	33kV Transformer (PM)	EHV	Each	None	Lite B
Overhead Pole Line	132kV OHL (Pole Line) Conductor	132kV	km	None	Lite B
Switchgear	132kV Switchgear - Other	132kV	Each	None	Lite B

If this strategy is adopted, then there will need to be the development of a technique that can produce values of PoF and CoF for an individual asset and hence create risk scores to support the NARMS objective. If it were possible to do this in the style of CNAIM, easily, then these assets would have already been included in the current CNAIM method.

- As these asset classes won't have been included previously the development of values which are used in CNAIM techniques may not be possible and proxy or alternative methods may need to be considered. Whilst the development of CNAIM brought a lot of additional understanding, assets in these categories may require additional input from consultants.
- In developing this form of modelling the outputs will need to support the objectives with regards to PoF, CoF and other general values. In addition, there will need to be an assessment as to the practicalities of the CoF measurements and modifiers when applied to these assets.

It is proposed that assets within this level shall be included at the discretion of the DNO during RIIO-ED2 as the volumes and data collection requirements need to be understood. There also needs to be consideration for an allowance in ED2 to commence the required data collection to develop this during the period in preparation for ED3.

- Introduce an additional information gathering plan in the period of ED2
- Agree an appropriate allowance mechanism to collect this data

These are asset groups that have very little or no data thus making it virtually impossible to carry out risk modelling at an individual asset level. These limitations make modelling in line with the current CNAIM virtually impossible and at best a risk can only be measured at the holistic level. The way risk is measured has not been formulated and needs further understanding and development.

- The relationships between PoF, CoF and risk therefore will need to be carefully designed to permit reporting in line with Ofgem requirements. It is likely that during these developments several assets may be identified as needing to be excluded from risk modelling techniques that are currently available.
- The table 11.1 list the assets which would be included under this category of assets for ED3:

# Table 11.1 – Level 4 CNAIM v2.5 Lite C

Asset	Name	Voltage	Units	ED1 Methodology	ED3 Assessment Methodology
Overhead Pole Line	LV Service (OHL)	LV	Each	None	Lite C
Cable	LV Main (UG Consac)	LV	km	None	Lite C
Cable	LV Main (UG Plastic)	LV	km	None	Lite C
Cable	LV Main (UG Paper)	LV	km	None	Lite C
Cable	Rising & Lateral Mains	LV	No. of Mains	None	Lite C
Cable	LV Service (UG)	LV	Each	None	Lite C
Cable	LV Service associated with RLM	LV	Each	None	Lite C
Switchgear	Cut Out (Metered)	LV	Each	None	Lite C
Cable	6.6/11kV UG Cable	HV	km	None	Lite C
Cable	20kV UG Cable	HV	km	None	Lite C
Protection	Batteries at GM HV Substations	HV	Each	None	Lite C
Protection	Batteries at 33kV Substations	EHV	Each	None	Lite C
Protection	Batteries at 66kV Substations	EHV	Each	None	Lite C
Protection	Batteries at 132kV Substations	132kV	Each	None	Lite C

If this strategy is adopted, then there will need to be the development of a technique that can produce values of PoF and CoF for an asset class and hence create a single risk score to support the NARMS objective.

The use of CNAIM with its modifiers is inappropriate and as such only a gross value of risk is likely to be derived. This has a knock-on impact on the ability to display assets in the manner of the 5 x 4 matrices as have been adopted in ED1 & proposed for ED2.

Whilst the development of CNAIM brought a lot of additional understanding, assets in these categories may require additional input from consultants.

In developing this form of modelling the outputs to include PoF, CoF and other general values so far as is reasonably practical. In addition, there will need to be an assessment as to the practicalities of the CoF measurements and modifiers when applied to these assets.

It is proposed that assets within this level shall be included at the discretion of the DNO during RIIO-ED2 as the volumes and data collection requirements need to be understood, but there will be an expectation that the assets will be included in regulatory returns for the period of ED3.

# Level 5 CNAIM v2.5

- In simple terms assets which are excluded from PoF and CoF and hence risk modelling will be classified as Level 5 assets and not included in any Risk modelling.

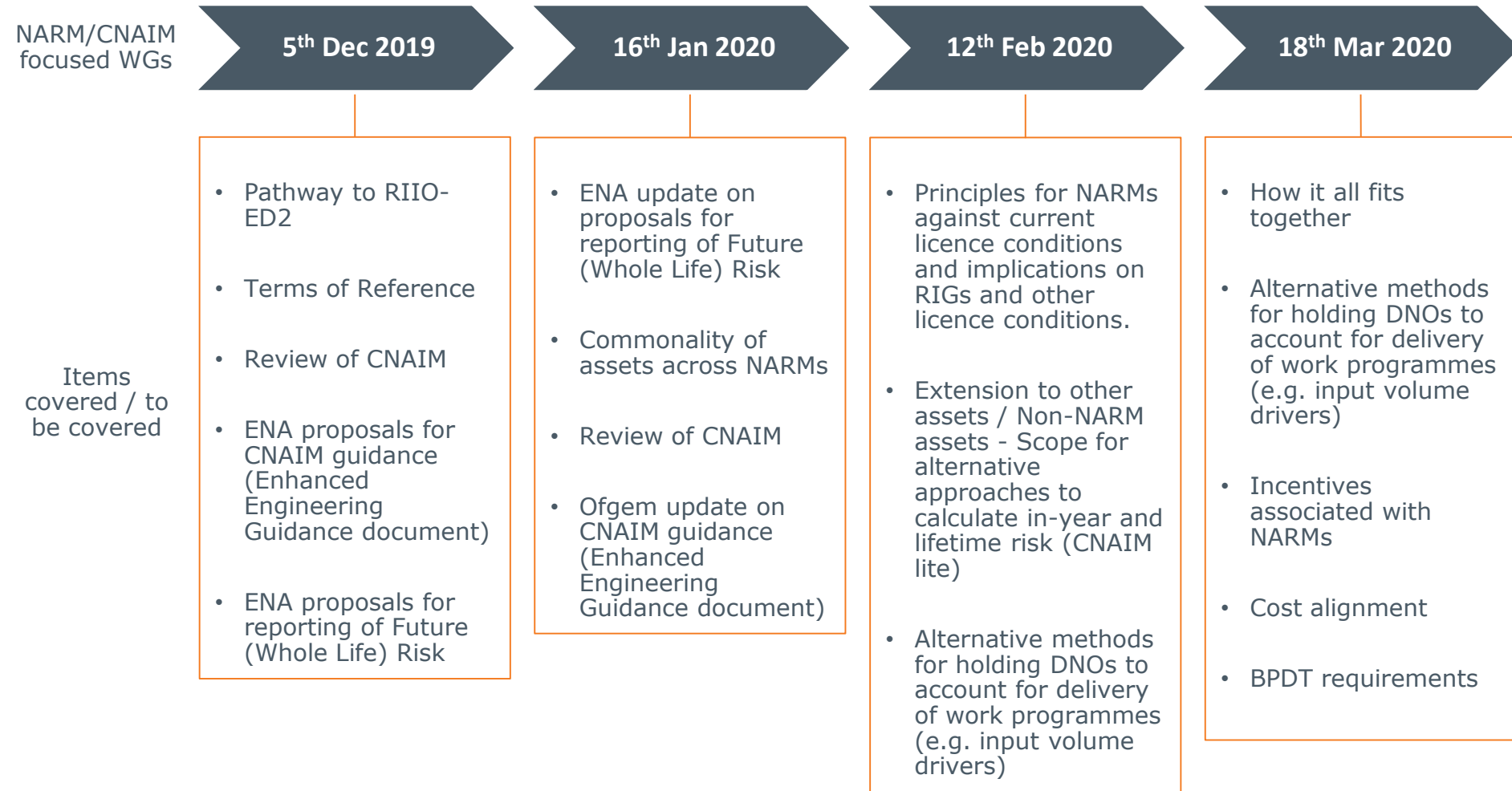


**Discussion Item: % delivery against target volumes vs. delivery against assets within risk trading arena**

### Items raised previously:

- % delivery against a target volume
  - Where actual volumes are different from the targets in the business plan then explanation should be provided
- delivery against assets within the risk trading area
  - Are licensees capturing alternative investments and asset trades. The alternative actions to meet the risk targets should be clear.
- What tools can be incorporated in the RIGs packs to improve reporting on these areas?

## **Actions, Next Steps, AOB**



- The next meeting will take place on 18<sup>th</sup> February, covering QoS. It will be in London.
- We will circulate notes and an actions log from this meeting.

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

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